

PAVING THE BUSINESS SECTION OF
TAMA, IOWA. WITH VITRIFIED BRICK

BY

C. W. COLLINS

ARMOUR INSTITUTE OF TECHNOLOGY

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PAVING THE BUSINESS SECTION OF TAMA, IOWA WITH VITRIFIED BRICK

A THESIS

presented by

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President and Faculty
of

ARMOUR INSTITUTE OF TECHNOLOGY

for the degree of

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May 27th., Nineteen Hundred Fifteen.

CHICAGO, ILLINOIS.

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C. W. Collins.

Chicago, Illinois,
May 27th, 1915.

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PAVING THE BUSINESS SECTION OF
TAMA, IOWA, WITH VITRIFIED BRICK.

When contemplating a new improvement, such as a water supply, sewer, or street paving system, the majority of small towns, not having sufficient work to retain an Engineer the entire year, will call on a Consulting Engineer to draw up plans, specifications, and estimate of cost for the proposed improvement, and to supervise the construction of the same. The writer has endeavored to trace the various steps involved in street paving in such a typical town; emphasizing particularly the duties and problems encountered by the Engineer. It has been his intention to bring forth many seemingly small details, which, nevertheless, are very troublesome and annoying at the time. As the writer was brought in personal contact with the work at Tama, he has taken it as an example of paving any town in Iowa, small differences naturally arising from local problems and conditions. Although the engineering problems would be almost the same in any other State, the legal steps would be quite different.

Tama, a town of about three thousand (3,000) inhabitants, is located in the central part of Iowa, about two hundred and eighty (280) miles west of Chicago, on the Lincoln Highway and the Chicago-Omaha divisions of the Chicago, Milwaukee and St. Paul Railway and the Chicago and Northwestern Railway. The Tama and Toledo Railway Company, a subsidiary of the Iowa Railway and Light Company, operates an electric line between Tama and Toledo, the county seat, which is about two and one-half (2-1/2) miles north of Tama. That part of its right-of-way in Tama, between the two aforesaid railroads and within the paving district, was paved.

The construction work, itself, comes as a climax to a succession of steps made necessary by law. The survey; the preparation of plans, specifications, and estimate; the resolution of necessity; the public hearing; the receiving of bids; and the drawing up of contract, constitute a few of the most important of these steps. The oversight of any of these points affords an opportunity for some shrewd lawyer

to bring suit against the City for certain fault-finding property owners who try to avoid paying their assessment.

The Engineer must be a diplomat in the fullest sense of the word. He must be tactful, patient, a mixer, a judge of men, and an optimist. He must be able to talk and explain a proposition in a layman's own language. He should weigh his words carefully before expressing himself on a subject, but, after once passing judgment and committing himself he should never change his original decision unless some out-of-the-ordinary, unforeseen cause arises.

These diplomatic qualities are brought into full play at the time the Engineer attempts to obtain the work. The necessity of, and the advantages to be derived from, the improvement must be enumerated. The whole view-point of two or three retired-farmer members of the Council in regard to improvements must be entirely reversed. Competition must be encountered and overcome. Sufficient evidence or references must be submitted to convince the Council of his competency. The Council's inclination to employ a local inexperienced man at a lower rate, rather than an expert from the large city, must have its fallacies shown; and the prejudices against, and distrust of, a city man must be overcome.

While construction is in progress, the Engineer acts as the town's engineering adviser. He must, at all times, advise the Council with an unbiased mind and from a non-interested-financially standpoint, but in so doing must not make unreasonable demands upon the Contractor.

LEGAL AND ENGINEERING STEPS
PRIOR TO CONSTRUCTION.

In June 1913, the City Council passed a resolution ordering property owners to make all necessary sewer and water connections with mains on certain streets which it contemplated paving. It was not, however, until January 8th, 1914, that a contract was made with an Engineer to prepare plans and draw up specifications and estimate of cost for such paving. The survey was made immediately afterwards and required about three days time to complete.

In making such a survey, a map or plat of the section of the town to be improved is obtained, and the recorded angles and distances are measured and checked. If no plat is available, or if the available one is unreliable, it becomes necessary to prepare a new one. The datum plane of previously established grades is determined and tied to if possible, but if none has been established, any conveniently located permanent point can be assumed to be a certain elevation above an arbitrary datum plane. Methods of disposing of storm water, location of underground improvements, and width of existing roadways are noted and recorded. Elevations of outside of walk on business streets, and inside of walk on residence streets, together with any curb which may be assumed as permanent, are taken at intersections and breaks of grade. Surface elevations of center line and gutters of existing roadways are determined at intersections, breaks of grade, and one-hundred-foot intervals, in order that an approximate estimate of excavation may be computed. Any other details are recorded which may be deemed necessary to draw up a complete set of plans in the office, from the field notes.

The plans are prepared very carefully in the office, with the thought uppermost in the designer's mind to have the new improvement fit the permanent points and conditions encountered in the most workmanlike manner possible. The resulting design is, oftentimes, far from a model one, but cannot be improved under the circumstances. The so-called permanent points, although possibly never established

by a responsible Engineer, are a reality not to be overlooked, but to be met. There is a decided lack of uniformity of grade and line of walks in the average small town. The walks are built to conform to original ground surfaces, to eliminate excessive grading, and with no thought of drainage, appearance, or future improvements. In order to avoid an extreme, unsightly, and dangerous construction, it is oftentimes advisable to disregard such a haphazard established line or grade.

The average layman in a small town has an erroneous idea of the required width of a paved street, especially in the business section. He has been accustomed to a wide street between walks, and when he learns it is to be narrowed, either by widening the walks or providing a parkway in the center, he objects quite strenuously and cites the congestion of traffic during Fair Week. When it becomes known, however, that the assessment increases in direct proportion to the increased width of pavement, and furthermore, that all hitching-posts on streets within the paving district are to be removed and an adequate public hitching-yard is to be provided in a central location, most objections are removed. A seventy-foot (70') street in a town represents a wasteful outlay of good pavement, which might otherwise have been distributed over, and benefited, other unimproved streets. In the writer's opinion, nothing less than a twenty-four-foot (24') width should be adopted, but, preferably, a twenty-seven-foot (27') or a thirty-foot (30') width for a residence street. On a street having a single-track carline, a minimum of a thirty-two-foot (32'), and preferably a thirty-eight-foot (38'), width should be adopted; but on one having a double-track carline, a minimum of a forty-two-foot (42'), and, preferably, a forty-eight-foot (48'), width should be adopted.

The type of pavement to be used is another important question. Space does not permit a discussion of the merits and faults of the various pavement materials. Each has its place, and overlaps and coincides in characteristics with another type. The first cost of an inferior or undesirable type appeals to the layman members of the Council, and to the property owners. The factors of maintenance,

depreciation, durability, cleanliness, noise, appearance, and adaptability to local climatic conditions must be called to his attention. Oftentimes, the town will receive bids on three (3) or four (4) types, and decide on which type to use at the time the work is let.

Twelve-inch (12") is the minimum size storm-drain that should be used. If the sewer grades are flat, catch-basins should be provided to prevent dirt from collecting in and stopping them up. Storm water should be removed from the street's surface as soon as possible. Valley gutters at street intersections, which are unsightly and very annoying to traffic; false gutters and drains, which require constant care in the removal of rubbish, ice, etc.; together with steps in line of pedestrian travel, should be avoided as much as possible.

It is needless to say that too much stress can not be laid on the proper drainage of the pavement, both of sub-grade and surface. From the standpoint of durability it is the prime essential, and from the appearance to the general public it is no less important. A minimum fall of one-fourth inch ($1/4"$) to the foot should be allowed between the inside grade of the walk and the curb grade. If the longitudinal grade of the street is sufficient to drain the walk and parkway, less fall may be allowed. Six inches (6") fall in one hundred feet (100') should be the minimum fall allowed in a longitudinal direction, although, if one lacks this amount and is certain that the gutters will be cleaned daily, four inches (4") in one hundred feet (100') is permissible. Pockets and pools in the gutter cannot be avoided on a more level grade, even with the most careful construction. On a level grade, a crown of two per cent (2%) of the roadway width should be allowed for macadam, asphalt, bitulithic, and the like, or a crown of one and one-half per cent ($1-1/2\%$) of the roadway width for brick and wood block, both crowns decreasing slightly as the longitudinal grade of the street increases. The section of roadway may be that of either a circle or a parabola, on a brick or a block pavement of ordinary width, although the parabola is better because the slope is a maximum near the gutter where there is a minimum of traffic. With the parabola, on an ex-

tremely wide roadway the slope becomes excessive near the gutter, and the straight line must be reverted to. On a macadam, or similar type of pavement, a straight line from crown to gutter is more satisfactory and warrants better drainage than the curves referred to above.

When the gutter on one side of the street is higher than that on the other, it becomes necessary to move the crown of the pavement toward the higher side an amount depending on the difference in height of the two (2) sides, and to avoid an excessively steep surface toward the low side and an approaching level surface on the high side. An extreme case of the above is when the crown is located at the gutter of the high side, and the water all drains transversely across to the low side resulting in what is termed a half roadway.

After the plans are carefully prepared, bearing in mind the aforesaid details, an estimate of cost is prepared. The quantities are computed direct from the plans at hand. The approximate amount of earth excavation is computed from center line and gutter surface elevations, or by assuming an average amount of cut over the entire pavement. The unit cost is based on the cost of previous work of a similar nature, allowances being made for local differences and changes in prices of labor, materials, and freight rates; or, in other words, on the actual labor-cost data available from work, current prices of material including freight rates, together with overhead charges, accident insurance, and interest of bond, amounting to about ten per cent (10%) and profit allowance of fifteen per cent (15%). The estimate is made sufficiently high to cover any unforeseen extras. In the State of Iowa, where the assessment is levied after the work is completed and is based on the final estimate, this precaution is not so important.

In Iowa, the property owners cannot file objections to the legality of the proceedings, assessment, and proper construction, until after the improvement is completed; while in some other States (Illinois, for example) the objections are all filed and settled before the work is commenced. As the Contractor receives no payment until the work

is completed and accepted, it is to his interest to finish it in the least possible time. Also, it is to his interest to live up to the specifications and make a good workmanlike job of the improvement, so that no property owner can tie up the final payment on the grounds of poor workmanship. Many property owners, who would have filed objections to the improvement before it was started (had they had the opportunity), after completion of the work realized its benefits and advantages, and filed no objections.

February 2nd, 1914, the proposed Resolution of Necessity was passed, notice of which, together with date of public hearing, was published four (4) consecutive weeks prior to the public hearing, in the Tama Herald and the Tama News, two (2) weekly newspapers of general circulation in Tama.

March 18th, 1914, after the public hearing, the Resolution of Necessity was passed and adopted in its original form, and all objections to the contemplated improvement were overruled. The City Clerk was directed to advertise for bids on work. Accordingly, on March 26th, 1914, and April 2nd, 1914, advertisements for bids were published in the "Engineering News" and "Engineering and Contracting". The bids were opened on the afternoon of April 14th, 1914, and acted upon by the Council on the evening of the same date.

Eight (8) contractors submitted bids, and they were as shown in tabulated form on Page 65. The contract was awarded to Thomas Carey and Sons, of Clinton, Iowa, the lowest responsible bidders. It was drawn up and signed May 1st, 1914, and approved by the Council on May 4th, 1914. Actual construction was commenced on Monday morning, May 11th, 1914.

CONSTRUCTION PERIOD.

The following is the usual order of procedure on brick paving:-

- Rough grading.
- Constructing storm water sewer.
- Constructing curb.
- Unloading brick.
- Hand grading and rolling.

Laying concrete base.
 Surfacing sand cushion.
 Laying and rolling brick.
 Cement grouting.

When the work is well under way, it can be seen in all its stages, from the curb building and grading at one point, to laying, rolling and grouting the brick at another.

Rough Grading.

Before any earth is moved, it is necessary that the Engineer take accurate cross-sections of the existing street surfaces. These should be taken at least every fifty feet (50'), longitudinally, and at crown, gutter, and intermediate transverse points where break is noted. After the pavement is completed, cross-sections are taken the second time, and the amount of excavation is computed by average end areas. Center line sub-grade stakes are set at one-hundred-foot (100') intervals and at break of grade, as a guide to the grading foreman.

The rough grading was started Monday afternoon and completed by 2:30 P.M., Thursday. Monday morning a gang of men removed the stone and concrete cross-walks at the intersections, to allow the grading machine to travel the entire length of the street without having to pull up the plow. A heavy rain on Sunday softened the hard-packed roadways and made the plowing easier.

The grading machine was equipped with a plow and a loading belt conveyor, and was drawn by fourteen (14) mules -- ten (10) ahead of the machine and four (4) behind it. As the machine moves forward, the plow throws the earth onto the belt conveyor, which conveys it up and in a direction transverse to that of the machine, into a dump-wagon moving along at the same rate, and parallel with the machine. As soon as a wagon is loaded, the machine stops, another wagon moves under the conveyor, and the process is repeated. This machine becomes inefficient under the following conditions, taken separately or collectively:

When the cut is only one (1) or two (2) inches.
 When rocks, bricks, and rubbish are mixed in the earth.

When the street is narrow.
When the street is short.

Sewer.

As hand excavation is reduced to a minimum by cutting down to approximate sub-grade before starting to excavate for the sewers, we find that the Contractor generally follows this order of procedure. The writer has found it most satisfactory to set grade-stakes about four feet (4') off center line, twenty-five feet (25') apart, and flush with the ground surface. The cut from top of stake to flow line is computed and recorded for each stake, a copy of which is given to the foreman. At each grade-stake the foreman or his assistant will drive a long stake on each side of the trench, measure up from the grade an amount sufficient, when added to the original cut, to make the total out a whole, or one-half ($1/2$), foot above the flow line. A board is made level at this elevation and nailed, transverse to the trench, to the two (2) stakes. When this is repeated at the next grade-stake, and a cord is drawn from one grade-board to the other, any point on this cord is the height, or out, already determined upon above the sewer invert. A wood grade-stick, divided into feet and one-half ($1/2$) feet, with a steel shelf bracket attached to one end, is used to set the pipe to grade. When the bracket rests in the flow line of the pipe, and the grade-cord, or line which is stretched from grade-board to grade-board, each of which is set the same height above the flow line, cuts this height in feet, on the grade-stick, the pipe is at grade.

When setting grades for manholes, catch-basins, and inlets, it is advisable to set them a trifle lower than is actually computed, as it is easier to build on than to tear down. The finished casting grade is given when the curb is built, or just previous to laying the concrete base. Care should be taken to give correct line on catch-basins and inlets, so they will fit the new curb.

A burlap sack, filled with excelsior or straw, should be drawn through the pipe to insure a clean joint and a smooth flow line. In back-filling, care must be taken not to break or crack the pipe

by dropping stones, brickbats or the like on it. The earth should be well tamped and flooded to prevent future settlement.

Unloading and Distributing Brick.

The brick used were manufactured by the Purington Brick Company, of Galesburg, Illinois. Arrangements were made to ship from thirty thousand (30,000) to thirty-five thousand (35,000) brick per day. To handle this quantity two (2) gangs were required, each gang consisting of nine (9) laborers, one (1) team, and three (3) wagons. A gang was divided as follows: five (5) men loading a wagon at the car, four (4) men unloading a wagon on the street, and the team en route, with a wagon, between the two (2) points.

As the section of the town paved lies between the Chicago, Milwaukee and St. Paul Railway and the Chicago and Northwestern Railway, the material haul was exceptionally short. Furthermore, on account of a strong competition between the two (2) railroads, better switching service and accommodations were obtainable than is possible in the average small town. Nevertheless, the foreman was compelled, a number of times, to break up an organized gang and put them on other work until the arrival of shipments delayed en route.

All the brick should be distributed on the streets before the concrete base is laid, to prevent driving over, and cutting into, it with heavy loads. They should be handled carefully, to prevent unnecessary chipping. The number of brick required, per lineal foot, on each side of the street, must be computed accurately, so that there shall be neither a surplus nor a shortage, although the former is more desirable than the latter. As the bricks, made by different dies and baked in different kilns, vary a small amount in size, it is advisable, when unloading a car, to place one-half ($1/2$) of it on one side and the other half on the opposite side of the street. Unless this precaution is taken, a carload of large brick is piled on one side of the street, and one of small brick on the other, which, when laying, results in one end of the row advancing more rapidly than the other. Of course, by laying the smaller

bricks "loose" and the larger bricks "tight", this trouble is overcome after a fashion, but the only satisfactory method of straightening out the line is to carry the brick on the lagging side across the street to the advanced end of the row, and the larger brick on the advanced side across to the lagging end of the row. One will readily see that this becomes very expensive and can easily be avoided.

Building Curb.

Immediately after taking roadway cross-sections, it is advisable to run curb lines, or, rather, offsets to curb line. An offset line is run on the sidewalk, and points are chiseled one hundred feet (100') apart on this line. In order that the form-builders can offer no excuse for a poor curb line, it is better to run an offset line on each walk. The center of the circular stones at street intersections and alley returns should be located. Grade-stakes are set from two (2) to four (4) feet off line at fifty-foot (50') intervals, or breaks of grade on a tangent, and at the center and two (2) points of tangency.

Patented steel forms were used in the beginning, but were found impracticable for such a high curb section. By the time it was safe to remove the face form, the concrete was too hard to finish. Later, the steel forms were used for the back, and two (2) two-by-twelve-inch (2"x12") boards for the face on tangent, and light half-inch (1/2") boards for the face on the curves. The upper face form could then be removed while the concrete was still "green" enough to finish, with little danger of it falling down. It was found necessary to clean and oil the steel forms each time before setting them up. Unless well braced on both sides, they would not hold to the line. Although a poor line has no effect on the life of the curb, it is very unsightly to the general public, a sign of carelessness and poor workmanship, and a point to be avoided.

Each night, after the completed work was measured and the number of sacks of cement used were counted, a check was made on the correctness of the mixture. A small gang, averaging seven (7) laborers, including the form-builder and the finisher,

built the entire four thousand six hundred and fifty (4,650) feet of curb, and managed, by working over-time and on Sundays, to keep out of the way of the grading gang.

The Northwestern brand of cement, manufactured by the Northwestern States Portland Cement Company, at Mason City, Iowa, was used throughout the work. For a small additional cost, the Contractor bought it through the local lumber company, who delivered it in any amount, at any time, and anywhere it was wanted on the work. The crushed stone was quarried at Stone City, Iowa, while the sand was pumped from a bar in the Iowa River about one mile from town.

Hand Grading and Rolling.

One cannot pay too much attention to making the sub-grade conform in shape to the finished pavement. The most important and trying part of the Engineer's work is over when the sub-grade is everywhere the pavement's thickness below the desired finished surface. An average thickness of concrete base is far from satisfactory; it must be uniform in thickness. The old maxim about the strength of a chain applies, without a doubt, to the durability and strength of a pavement. Hand grading, with mattox, pick and shovel, has been, and is, a necessary evil and expense, although much has been eliminated with the modern grading outfits.

The finished pavement gutter grades were carefully set with an instrument, and chiseled on the curb face on each side of the street at fifty-foot (50') intervals. A cord, chalked with carpenter's blue chalk, was stretched between two (2) adjacent grade-points, and, when snapped, marked a blue line on the curb face. This line was eleven inches (11") above gutter sub-grade, six inches (6") above concrete grade, four inches (4") above sand-cushion, and flush with the finished gutter grade. With few exceptions, the gutter grades differed on opposite sides of the street, so it was necessary to set practically all concrete base grade-stakes with an instrument. With the use of small nails in the top of the stakes, cord was stretched from the top of one stake to the top of one adjacent to it. The ground, under the cord, was graded to a depth of

five inches (5") below it, and, after all sides of a section were graded, the center was surfaced by eye to meet the side grades.

The writer is doubtful whether or not the results obtained warranted such fine work. At much less cost excellent results can be obtained by an experienced man, "with a good eye for grade", operating a road-grading machine.

Although, as was previously said, most of the stakes were set with an instrument, yet the use of tee- or sight-boards should not be overlooked. They consist of three (3) boards about one-by-four inches (1"x4"), two (2) of them being three feet (3') long and the other one about three and one-half feet (3-1/2') long, each of which has a brace at one end so that it can stand vertical. The two (2) boards of equal length are placed in the gutters of same grade, on opposite sides of the street. The line of sight from the top of one board to the top of the other is a level line. If it is required to make the crown eight inches (8") above the gutter, the line of sight from gutter-board to gutter-board will cut the third board eight inches (8") below the three-foot (3') mark when setting the crown, and six inches (6") below the three-foot (3') mark when setting the point half way between the gutter and the crown, commonly known as the quarter-point, to grade. Another method of obtaining the same results is to stretch a level cord across the street, a known height above the gutter, and measure from it to set any grade. If the cord was twelve inches (12") above the gutter, in the case cited above, we would measure down four inches (4") at the crown and six inches (6") at the quarter-point, in setting them to grade.

The sub-grade was rolled with a ten-ton, three-wheel, Kelly-Springfield roller, after which it was again checked before laying the concrete base. The amount necessary to allow for compression under the roller varies with the type and with the condition of the earth.

Laying Concrete Base.

There are two (2) general methods of laying the

base. First, that of distributing the material in sufficient quantity, along the street, to pave the entire width, or only a part of it, depending upon the maximum width of the street on which the mixer works most efficiently; dumping the mixture in the desired point on the street direct from the mixer, by means of a carrier traveling on a boom, a chute, or by wheelbarrow; and moving the mixer forward, intermittently, as the material is cleared away in front, and as the concrete base approaches it from behind. Second, that of making the mixer stationary at a well located point, possibly an intersection; having large piles of material, or hauling same closely; conveying the concrete to the desired point on the street in horse-drawn carts, and moving the machine only when the base surrounds it on all but one side, which must be used as an outlet. Each method has its several advantages, and is better adapted to certain conditions than the other one is.

The latter method was used on the work under consideration. With a gang consisting of seventeen (17) laborers, a mixer-operator, and two carts, the maximum day's work of nine hundred and sixty (960) square yards of five-inch (5") base was laid at a labor-cost of about forty-five dollars (\$45.00). A practice was made of measuring up the day's work, at night, counting the cement sacks used, and checking up on the average mixture for the day. Although a uniform, rather than an average, mix is required and should be obtained, the latter is a fairly good check on the former for short periods of time. The mixture should be so wet that, with light tamping, the cement will flush to the top and insure a hard, smooth surface. The street should be well barricaded for a week, to give the base an opportunity to set up. If it is warm weather, it is advisable to sprinkle the base two (2) or three (3) times a day, to keep it from setting up too rapidly.

Sand Cushion.

After a period of seven (7) days has elapsed since the completion of the base, the sand is hauled onto it. The amount of sand required, per lineal foot of pavement, is computed and it is distributed accordingly. Care should be taken not to drive over the bare concrete with a loaded wagon, as the steel

tires do much harm. A roadway of sand should be made for the wagons to travel back and forth over.

The sand used should be clean and coarse -- clean, to prevent its cementing, hardening, and finally losing its cushion characteristics; and coarse, to permit good drainage and to prevent its working up between the joints of the bricks when rolled.

As an average sand-cushion depth of two inches (2") could be interpreted to mean four inches (4") in one place and none in another, it is necessary to specify a uniform depth of two inches (2"). So, again, we see the reasons for surfacing the sub-grade properly, and laying the concrete base to proper grade. If a sag or pocket is left in the sand - oushion, it is bound to show up on the finished brick surface.

When the streets are of variable widths, or the crowns are off the center lines, and a number of intersections are to be paved, it is almost impossible to use a templet to surface the sand. A ten-foot (10') to fourteen-foot (14') straight edge, supported at each end by a one-by-four-inch (1"x4") stringer, whose upper face is two inches (2") above the concrete base, can be dragged transversely across the street, to surface the sand; provided, one is satisfied that the concrete base is at proper grade. Excellent results can also be obtained by setting bricks to grade at crown, quarter-point, and any other necessary intermediate points, either with an instrument or with tee-boards, drawing a cord longitudinally from top of one brick to that of the adjacent one, about fifteen feet (15') ahead, grading the sand under the cord by dragging a brick along flush with it, and, finally, surfacing the section between two (2) such grade lines by eye. An experienced sand-cushion man is a great asset to a Contractor.

Laying Brick.

With a gang of twenty-one laborers, including carriers, two (2) batters, one (1) brick setter, four (4) sand-cushion men, and a clean-up man, eight hundred and sixty (860) square yards were laid in a day at a labor-cost of about forty-six

and 40/100 dollars (\$46.40). Another day, with a gang of twenty-five laborers, including carriers, two (2) batters, two (2) brick setters, four (4) sand-cushion men, and a clean-up man, one thousand two hundred and sixty (1,260) square yards were laid at a labor-cost of about fifty-five and 60/100 dollars (\$55.60).

By laying the bricks at the gutter against a one-by-four-inch (1"x4") board placed on edge in the sand-cushion with small blocks or spreaders between it and the curb, leaving the board in place until after the brick are rolled, then removing the spreaders with a pick, tamping brick lightly to grade, and filling the space between the brick and curb with a pitch filler, an ideal expansion joint is obtained at a minimum of cost. A patented asphaltic-felt board eliminates many of the disadvantages of the above method.

The pavement should be inspected for underburned or soft, over-burned or brittle, broken, chipped, and kiln-side-up bricks. The soft brick is the most objectionable to leave in and most difficult to pick out. It can, oftentimes, be detected by its light pink color and by its property of absorbing more moisture than other bricks do. A bamboo pole, about three and one-half (3-1/2) or four (4) feet long, with a piece of yellow or blue lumber crayon clamped on one end, makes an excellent pencil for the inspector. After the roller has been over the bricks, the badly chipped and broken ones should be culled out. Care must be taken to tamp bricks to grade, which were replaced after the section was rolled. To eliminate unnecessary turning of bricks, the carriers should be instructed to turn the rough, or kiln, side of the brick down before carrying it out to the brick setter.

Although it is generally specified that the bricks at an intersection shall be laid at an angle of forty-five degrees (45°) with the roadway, the results obtained do not always warrant such a construction. It is an established convention, and hard to break away from. The two (2) rough joints across the entire width of each intersecting street soon develop into weak and unsightly spots.

Cement Grout Filler.

Too much attention cannot be given to this last, but most important, step in the work. It is necessary to fill the joint between the brick, from bottom to top, with a uniform mixture of grout. The sand should contain no small pebbles, which would tend to stop up the joints before they were filled. To prevent chipping the edges of brick, and to reduce noise to a minimum, the joints should be filled flush with the surface of the brick. The specifications should be followed very closely.

It was found satisfactory to mix a large batch dry on the mixing-board, to wheel it to the mixing-box, mix thoroughly with water, stir constantly, remove with scoop shovels, and pour into the joints, the thin grout working down to the bottom, and the denser being brushed into, and filling, the upper part of the joint.

Railroads.

Both railroads were ordered by the City Council to pave across their right-of-ways on McClellan, State, and Siegel Streets. The Chicago and Northwestern Railway contemplated raising their two (2) main tracks about six (6) inches with stone ballast, so they delayed paving until after the Contractor had completed his contract, and were, therefore, compelled to do the work themselves. As the Chicago, Milwaukee and St. Paul Railway was laying a second main track, building a new depot, improving the station grounds, and carrying on considerable permanent improvements at the time, arrangements were made with the Contractor to pave their portion. The total cost of their improvement was submitted by Mr. E. L. Sinclair, District Engineer, as follows:

936.7	sq.yds. brick pavement @ \$1.89,	\$1,770.36
224.0	sq.yds. brick pavement (base laid by Railway Company) @ \$1.40	313.60
47.6	sq.yds. brick pavement (Street Railway crossing over Railroad Company's right-of-way) @ \$2.50	119.00
64.2	Lineal feet concrete curb @ \$.40	25.68
153.	cu.yds. excavation @ \$.60	91.80
Total ---		\$2,320.44

An eight-inch (8") concrete foundation was built under the ties, and gravel was tamped between them. Brick filled with pitch was laid between the rails over the ties. The writer questioned the ability of such a construction to stand up under the excessive vibrations due to weight and speed of rolling stock. Oak planking between the rails would, undoubtedly, have given better service.

Street Railway.

No provisions were made in the original paving contract to pave the Street Railway, although the latter had been given due notice to pave, and pay for, seven feet (7') of the roadway of the streets to be paved over which it operated. When the Street Railway Company realized that the street paving was a certainty, and in order that their assessment might be paid in seven (7) annual installments, similar to those of the property owners, a contract was drawn and signed, on the Third day of August, 1914, between the Contractor, the Street Railway Company, and the City.

The roadway was excavated six inches (6") below the normal crown sub-grade. After being rolled and thoroughly compacted, clean crushed stone was laid thereon and rolled with a ten-ton roller until it was thoroughly compacted to a uniform thickness of six inches (6"). Five-inch (5") cedar ties, impregnated with tar, were laid on the stone, and six-inch (6") sixty-pound (60#) special Lorain Steel Company's Tee-rails were bolted thereto and brought to proper line and grade by tamping and surfacing the ties with small stone. The concrete base between the rails was laid at the same time as that from the rail to the gutter.

The brow of the pavement one foot (1') outside of the rail was made one inch (1") lower than the rail, in order to insure perfect drainage. Pitch filler was substituted for the cement grout, as it was uncertain whether the latter would stand up under the vibration of the moving trolley cars.

The total cost of paving seven hundred and ninety-five (795) lineal feet, seven feet (7') wide, was as follows:-

618.3 sq.yds. pavement	@ \$2.50,	\$1,545.83
220.0 cu.yds. earth exoavation	@ \$.40	88.00
155.0 cu.yds. crushed stone (car measurement)	@ \$2.00	310.00
Engineer's Fee		87.02
Total -		<u>\$2,030.85</u>

Concrete Walks.

In order that the improvement might have a finished appearance when completed, arrangements were made with the Contractor to extend the concrete walks at intersections to meet the new curb grade and line. On the west side of State Street, north of Fourth Street, where it was necessary to build the curb higher than the walk, the City, at its own expense, ordered the Contractor to build a new concrete walk for the property owner.

The walks were built of a one-two-four (1:2:4) concrete mixture, four inches (4") thick, together with a one-half inch (1/2") cement mortar finish, composed of one (1) part cement with one and one-half (1-1/2) parts sand. As cinders were not available for a foundation, four inches (4") of coarse sand was used as a substitute.

The cost of the walks was as follows:

1871 sq.ft. concrete walks at intersections	@ 12-1/2¢	\$233.87
581 sq.ft. concrete walks adjacent to private property	@ 12-1/2¢	72.63
Total --		<u>\$306.50</u>

Electric Lighting.

Through the efforts of the Commercial Club, the merchants contributed to an electric-light fund, whereby sufficient money was raised to install electroliers within the paving district, as shown on the general plan. Forty-six (46) five (5)-cluster (four 40-watt, one 60-watt) electroliers were installed at an average cost, each, complete, of fifty-five dollars (\$55.00).

Three (3)-conductor, number eight (8) copper, Simplex steel-taped safety-cable, manufactured by the Simplex Manufacturing Company, of Boston, and

costing two hundred and eight and 50/100 dollars (\$208.50) per one thousand feet (1,000'), was used between poles. It was laid on the finished sub-grade just before the concrete base was laid.

The poles were manufactured by the McDonald Iron Works, of Des Moines, Iowa, and cost twenty-six dollars (\$26.00) each. They were of cast iron, eleven feet and nine inches (11'-9") in height, with a round base seventeen inches (17") in diameter.

The following is a list of the cost of accessories:-

10-inch frosted globes	\$5.00 per doz.
12-inch frosted globes	6.00 " "
60-watt 110-volt Tungsten lamps	.40 each
40-watt 110-volt Tungsten lamps	.30 "
5 sockets for each pole	.10 "
3 fuse-blocks for each pole	.22 complete
50 ft. No. 14 R. C. copper wire	3/4¢ ea. pole
Estimated cost of laying cable	.05 per ft.
Estimated cost of installing pole	10.00
All material F. O. B. Tama,	

The lamps were connected in parallel in each pole and on a 110-volt alternating circuit.

It was planned to have all lights on until 10 P.M. week days, and until 11 P.M. Saturdays, after which time only the top light would be on, for the remainder of the night. The power was furnished by the Iowa Railway and Light Company, at a flat rate of one and 95/100 dollars (\$1.95) per pole. per month.

The system was installed by Ludwig and Hanna, local Electrical Contractors.

Daily Report Cards and Cost Data.

In order that the Engineer's home office might keep in close contact with the progress of the work; that labor-cost data might be compiled and used for future estimating; and that a daily record of the work might be kept for future reference, in lieu of a dispute arising at final settlement, the daily report card was adopted. The Resident Engineer, in filling out the report, should record all important happenings of the day, and distribute the labor-cost

carefully so that it will be dependable. After a hard day's work, there is a tendency to shirk this duty and to give as little information and data as possible, but, later, the Engineer will derive the benefit and will realize the importance of a complete report.

The following labor-costs were compiled from the daily reports:-

Overhead labor-charges,	
comprising general foreman, on	
straight time,	per day, \$5.00
Time-keeper and assistant fore-	
man, straight time,	per day, \$3.00
Assistant time-keeper, per day,	\$1.75
Interpreter,	per hour, .25
Lamp and barricade tender,	total, \$25.00
Engineer's helper	total, \$50.00
Total - - - - -	\$1,175.00

Excavating and hand grading (Preparation of sub-grade, including labor on Street Railway and Chicago, Milwaukee and St. Paul Railway)	2,300.00
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Curb (including excavation, hauling material, setting forms, mixing and placing concrete, finishing, removing forms, and back-filling both sides of curb.)	925.00
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Hauling stone for concrete base	550.00
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Hauling brick	900.00
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Sewer work (including hauling pipe, castings, and all necessary materials; excavating, laying, and back-filling; and building manholes, catch-basins, and inlets.)	450.00
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Laying concrete base	900.00
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Laying and rolling brick	1,150.00
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Grouting	400.00
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Concrete walks at intersections	200.00
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Clean-up (including loading and unloading tools and machinery; cleaning up parkways; grading approaches, etc.)	130.00
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Total labor-cost,	<u>\$9,080.00</u>
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Although these are not pay-roll amounts, yet they are accurate enough for estimating purposes.

SAMPLE DAILY REPORT CARD

Report 57 Date 7/11/14 Town Toma Weather 105° Clear Sultry

Gang	Today	Total	Location				
1 Grading			N. State St.				
2 Hauling Stone			E. 3 rd St.				
3 Curb	45'	2390	4 th St.				
4 Concrete base	170 ⁰ Yds	8450	S. State St.				
5 Brick (laying)	620 ⁰ Yds	3930	W. 3 rd St.				
6							
Overhead (Supt., Tkpr., Clerks Nightwman, etc..)		9 25	Labor Cost				
Gang No	Foreman Hrs	Lab. Hrs	Lab. Hrs.	Misc. Hrs	Team Hrs.	Am't.	Total
1	5 @ .25	76 @ .20			2 @ 50 2 @ 45	18 35	
2	4 @ .25	34 @ .20			10 @ 45	12 30	
3	10 @ .35	20 @ .20	10 @ .25			10 00	
4	5 @ 30	73 @ .20			3 @ .55	17 75	
5	9 @ .35	100 @ .20	9 @ 40 7 @ 30			28 85	
6							96 50
Total							

REMARKS:-

22 bbls. cement used on base,

Weekly pay-roll \$ 715.85,

John Carey in to-day,

Sending tracing under separate cover.

G.W. Collins

LEGAL AND ENGINEERING STEPS
SUBSEQUENT TO CONSTRUCTION.

Final Estimate.

The completed work should be measured and the quantities computed and checked very carefully. As the assessments are based directly on the final estimate, an error in the latter would cause ten-fold more work and trouble later. The final estimate of cost was as follows:-

23 inlets	each,	\$8.00	\$184.00
13 catch-basins	each,	35.00	455.00
4 manholes	each,	28.00	112.00
3,200 cu.yds. excavation	@	.40	1,280.00
800 lineal feet 9" tile sewer	@	.40	320.00
933 lineal feet 12" tile sewer	@	.50	466.50
4,654 lineal feet concrete curb	@	.40	1,861.60
15,308 sq.yds. vitrified brick pavement	@	1.89	28,932.12
Force account			43.55
Fee to Engineer, 4-1/2% of contract,			1,545.83
Printing Notices of Intention to pave (4 weeks)			120.30
Advertisements for bids	\$69.70		
Specifications	24.00		93.70
Printing of waivers, notice of filing plat and schedule, advertisement for bids in Engineers and Contractors Journal, posters, two (2) sets of bonds.			126.00
Attorney's fees for preparing procedure, resolutions, ordinances, spreading assessment and schedule			600.00
Rattler tests and other incidental expenses			50.00
Total cost of paving Iowa Railway and Light Company's right-of-way			2,030.85
Total,			<u>\$38,221.45</u>

Spreading Assessment.

The assessment was made, and the cost of improvement was assessed against all lots and parcels of land according to area so as to include one-half ($1/2$) of the privately owned property between the street improved and the next street, whether such privately owned property abut upon such street or not, but in no case on privately owned property situated more than three hundred feet (300') from the street improved, and against railways and street railways having tracks thereon, in proportion to the benefits accruing thereto and in accordance with the law governing such assessment, including the cost and expense of said improvement at street intersections and alleys.

Each individual will spread an assessment by a different method than another would, but the final results should come out almost alike. His assumptions in starting out must be logical and based on the law governing assessments.

It was first assumed that one hundred (100) square feet of property abutting on the fifty-six-foot (56') pavement should equal one (1) assessment unit; and that one hundred and thirty-four (134) square feet on a forty-foot (40') street, one hundred and forty-three (143) square feet on a thirty-six-foot (36') street, one hundred and fifty-three (153) square feet on a thirty-three-and-one-half-foot ($33-1/2'$) street, or one hundred and sixty-seven (167) square feet on a thirty-foot (30') street, should, accordingly, equal in value to this unit. The total number of units was found to equal three thousand five hundred and twenty-nine (3,529). After deducting the total Street Railway assessment, and the cost of curb assessed direct, from the total assessment, the balance was divided by the total number of units to obtain the value of one unit. One (1) unit was found to equal nine and 80/100 dollars (\$9.80). In computing areas, the average depth of a lot was assumed as eighty feet (80'), the minimum as sixty feet (60'), and the maximum as one hundred feet (100'). The cost for pavement on side streets was assessed fifty per cent (50%) to the twenty-five feet (25') abutting on such side street, and the remaining fifty per cent (50%) was assessed

equally against the remaining property as far as the center of the block.

Where the assessment against a lot exceeded twenty-five per cent (25%) of its assessed valuation, the excess was charged to the City Improvement Fund.

After computing the assessments, they were carefully checked over, and, in several instances where the benefits did not seem equal, they were properly adjusted.

The final assessments were as shown on the assessment plat, in the Appendix.

The work was completed and accepted by the Engineer on August 28th, 1914, and on the same date the City Council passed a Resolution accepting the street improvement, and ordering Plat and Schedule filed. Notice of filing Plat and Schedule was published for two (2) consecutive weeks in the two (2) weekly papers. On November 10th, 1914, at a regular meeting of the Council, a resolution was passed overruling objections to the assessment plat and schedule, and accepting and approving the same. On the same date, a resolution was passed directing payment to the Contractor. December 14th, 1914, a resolution was passed ordering issuance of bonds for balance due on the assessment against abutting property. December 16th, 1914, a certificate of special assessment was submitted to the County Auditor. Bonds were issued to the amount of twenty-four thousand five hundred dollars (\$24,500.00), varying in amounts from one hundred dollars (\$100.00) to one thousand dollars (\$1,000.00), drawing interest at six per cent (6%) and maturing in from one (1) to seven (7) years.



GRADING
MACHINE IN
OPERATION

CONSTRUCTING
CONCRETE
CURB



STREET RAIL-
WAY TRACKS
PREPARATORY
TO LAYING
CONCRETE BASE.



CONCRETE
MIXER IN
OPERATION



LAYING BRICK



LAYING
CONCRETE
BASE.

APPENDIX

SPECIFICATIONS FOR PAVING
IN THE CITY OF TAMA, IOWA.

INSTRUCTION TO BIDDERS.

It is the intention of these specifications to provide for this improvement in a complete, thorough and workmanlike manner. The Contractor to whom the work is awarded shall furnish all materials, labor and appurtenances necessary to complete the work in accordance with these specifications, and anything omitted herein that may be reasonably interpreted as necessary to such completion is to be merged in the unit prices bid for the improvement.

No bid will be accepted which does not contain an adequate or reasonable price for each and every item named in the schedule of quantities.

Bidders must satisfy themselves by personal examination of the location of the proposed work, and by such other means as they prefer as to the accuracy of the estimate of quantities.

Bidders must present satisfactory evidence to the City Council that they have been regularly engaged in the business of laying pavements, or are reasonably familiar therewith, and that they are prepared with the necessary capital, machinery and materials to do the proposed work. No bid will be accepted from any person or firm who may be in arrears to the CITY OF TAMA upon debt or contract, or who may be in default to said CITY OF TAMA, or behind specified time on any previous work. Companies or firms bidding for the work herein described must state in the proposal the individual names and places of residence of the persons comprising said company or firm. The City Council reserves the right to reject any or all bids, or to accept bids separately. All bids must be accompanied, in a separate envelope, with a certified check, payable to the order of the City Treasurer, in a sum of three thousand (\$3,000) dollars, as security that the bidder will enter into a contract for the doing of the work and will give a bond in the sum of thirty thousand (\$30,000) dollars, conditioned upon the proper carrying out of the terms of his contract and the faithful performance thereof. Checks or cash will be returned when the contract is signed.

All bids must be made on forms provided for that purpose, and the Contractors are especially warned not to put in alternative propositions changing some part of the specifications, for such propositions will not be considered.

The plans and drawings showing location and dimensions of work to be constructed, prepared by the Engineer, and on file in his office and the office of the CITY CLERK with all notes, dimensions, figures and corrections thereon, shall be considered a part of these specifications, and in event of any discrepancy between the plans and specifications, the judgment of the Engineer shall be decisive thereon.

All papers submitted to bidders, except only those of the successful bidder, are to be returned to the Engineer upon demand.

DIRECTION, SUPERINTENDENCE AND INSPECTION.

The Contractor shall perform all the said work under the direction and superintendence of the Engineer and to his entire satisfaction, approval and acceptance. All material to be incorporated in the work and all labor performed, and all appliances, tools and methods used shall be subject to the inspection and approval of said Engineer, and said Engineer reserves the right to decide finally all questions arising as to the proper performance of said work and as to whether the rate of progress thereon is such as to correspond with the conditions of these specifications.

The Contractor shall furnish and drive all stakes, and at any time requested by the Engineer, or his representative, shall furnish all assistance desired by said Engineer.

Wherever the word "Engineer" is used in these specifications it shall be understood to mean the AETNA ENGINEERING BUREAU, or any of its engineers who shall be placed in charge of the work, limited by the duties imposed upon them.

Where the word "Contractor" is used in these specifications it shall be understood to mean the person or persons, firm or corporation to whom the work herein described has been let.

Wherever the word "Council" is used it shall be understood to mean the CITY COUNCIL of the CITY of TAMA, IOWA. Said Council shall be the final

authority in all cases, and is not bound to accept the work even if passed by the Engineer when any part so passed is obviously not in accordance with the spirit of the specifications.

ASSIGNMENT PROHIBITED.

No part of the work herein specified shall be assigned or sub-contracted without the written consent of the Council and in no case shall such consent relieve the Contractor from the obligation entered into by him, or change the terms of this agreement.

LIABILITY OF CONTRACTOR.

If, in the prosecution of said work, it shall become necessary to dig up, use or occupy any street, alley, highway or public grounds of said City of TAMU the Contractor shall erect and maintain such strong and suitable barriers, and also during the night time such lights, as will effectually prevent the happening of any accident, or harm to life, limb or property in consequence of such digging up, use or occupancy of said street, alley, highway or public grounds, and the Contractor shall be liable for all damages of every kind and nature occasioned by reason of his failure to comply with any of the provisions mentioned in this paragraph. Said Contractor shall be liable for any damage to persons or property occasioned by the negligence of such Contractor, his agents, employees, workmen or assignees.

MANNER OF PAYMENT.

If the rate of progress shall be satisfactory to the Council and when it appears that all claims for labor herein noted have been satisfied, payment will be made to the Contractor in special assessment certificates bearing interest at the rate of six (6%) per cent per annum, issued in accordance with the provisions of Section 841 of the Code, to the extent that the cost of the same is assessable by law against all lots and parcels of land abutting thereon and including one-half of the privately owned property between the streets so proposed to be improved and the next street, whether abutting upon said street or not; but not to include privately owned property situated more than three hundred (300)

feet from the street proposed to be improved, and estimates will be issued to said Contractor monthly during the making of the said improvement for eighty-five (85%) per cent of the value of the work done and in place at the time of issuing such estimate, and estimates for the balance or remainder will be issued upon the final completion and acceptance of the work, except as hereinafter noted.

TIME FOR COMPLETION OF WORK.

The work to be performed under these specifications shall be commenced on, or before, the 15th day of May, 1914, and shall be fully completed on, or before, the 1st day of September, 1914. The said time specified for the completion of the work is an essential condition of this contract, provided, however, that if the Contractor is delayed by the CITY OF TAMA in the commencement of the work or in case the work is suspended by order of the City Council, then the time of such delay or suspension shall be added to the time for the completion of this contract.

EXTENSION OF TIME.

In case the Council, notwithstanding the failure of the Contractor to complete the work within the time specified, shall permit the said Contractor to proceed and continue and complete the same as if such time had not elapsed, such permission shall not be deemed a waiver in any respect by the Council of any forfeiture or liability for damages or expense thereby incurred arising from such non-completion of said work within the time specified and covered by the liquidated damage clause of the specifications, but such liability shall continue in full force against the Contractor as if such permission had not been granted.

LIQUIDATED DAMAGES.

For each day of delay beyond the day set in these specifications for completing the work, all in accordance with the plans, specifications and directions of the Engineer, the Council shall withhold permanently from the Contractor as total compensation the sum of twenty-five (\$25) dollars. This sum thus withheld shall not be considered as a

penalty but as proven liquidated damages suffered by the City of TAMA by reason of the failure of the Contractor to finish his work in the stipulated time, and from it shall be paid the sum of ten (\$10) dollars per day for Engineering and Inspection.

BOND REQUIRED.

An approved surety bond for thirty thousand dollars (\$30,000) will be required of the Contractor, and said bond shall cover the construction period as a guarantee of the faithful performance of the contract. On completion and before the acceptance of the work an approved surety bond of twenty-five (25%) per cent of the contract price of the work will be furnished by the Contractor and said bond shall cover the guarantee period.

CONTRACTOR'S DEFAULT.

The said work shall be prosecuted with such force as the Engineer deems adequate for its completion within the time specified, and if at any time the Contractor refuses or neglects to prosecute the work with a force sufficient, in the opinion of said Engineer for its completion within the said specified time, or if in any event the Contractor fails to proceed with the work in accordance with the requirements and conditions of these specifications, the Council shall have full right and authority to take the work out of the hands of the Contractor and to employ workmen to complete the unfinished work and to deduct the expense thereof from any money that may be due and owing to the Contractor, or to relet the same to other Contractors.

In case the Contractor abandons or in any manner fails to complete said work in the time specified, the City Treasurer of the CITY OF TAMA is hereby authorized and empowered to pay any laborer or laborers who may have been employed by such Contractor upon the specified work, out of any of the funds due such Contractor any and all sums of money which may be found to be due and owing to such laborer or laborers, and without giving any notice whatsoever to said Contractor of the intention so to do, and in every case the City Treasurer is hereby authorized and empowered to ascertain the amount or amounts so due or owing to such laborer or laborers from said

Contractor in such manner and upon such proof as he may deem sufficient and without giving any notice of such proceeding to such Contractor, and the amount or amounts so found by him to be due and owing to such laborer or laborers shall be final and conclusive as against said Contractor and may thereafter be paid over by said City Treasurer to such laborer or laborers. The failure of the Council to comply with the conditions of these specifications in regard to unpaid laborer or laborers shall in no wise effect the liability of the Contractor or his sureties to the CITY OF TAMA or to the person or persons who are or who have been in his employ.

FORFEITURE OF CONTRACT.

If the work is not begun at the time herein stipulated, or if the rate of progress at which such work is performed should not, in the judgment of the Engineer, be such as to insure its progress and completion in the time and manner herein stipulated, or if said work shall be wholly or in part improperly conducted, then the COUNCIL may declare the contract for said work forfeited, either as to a portion or the whole of said work, and may relet the same, or order the entire reconstruction of said work if improperly done, and in any case of default may determine the damage or price (if there be any) which according to a just and reasonable interpretation of these specifications and the contract as a whole, the Contractor ought, in the opinion of said COUNCIL, to pay to the CITY OF TAMA for any failure to commence and prosecute or to construct said work in all respects according to the conditions herein specified or for any other default. It is further understood and agreed that for the amount of damages or price determined by said COUNCIL to be paid to the CITY OF TAMA by said Contractor for any such default or for money paid out by said CITY TREASURER on account of said Contractor in consequence of said default, there may be applied in payment thereof a like amount of any money that may be due and owing to the Contractor. If there should not be a sufficient amount retained from said Contractor then and in such case the amount to be paid by the said CITY OF TAMA in consequence of such default shall be a just claim against said Contractor and be recovered before any court of competent jurisdiction.

In case the said COUNCIL deems it necessary to declare any portion or section of said work forfeited, it is expressly stipulated and understood that such declaration or forfeiture shall not in any way relieve said Contractor from the covenants and conditions of the contract for said work, but that the same shall be and remain valid and binding on said Contractor.

GUARANTEE.

It is understood and agreed that all labor and material shall be of such character that the entire work, including the restoration of the surface of any street shall be and remain in good condition during the entire period of five (5) years from the acceptance of the work, and the Contractor hereby agrees to keep it in perfect repair during such period the whole of his work, except in cases where repairs may be rendered necessary by causes clearly beyond his control.

In the event that any pavement, sidewalk, crossing or other surface which may have been disturbed in the prosecution of the work shall not be restored by the Contractor within a reasonable time after the completion of the work and the acceptance of the same by the COUNCIL, or if any such pavement, sidewalk, crossing or surface because of the settlement of the back-filling or other conditions incident to construction be in bad condition during the period of five (5) years after the acceptance of the work, or if any of the Contractor's work be found defective or incomplete during such period and the Contractor neglects to repair such defective work within thirty (30) days from the receipt of notice from the COUNCIL, directing him to make such repairs, the COUNCIL may make such repairs and restoration of the surface of the streets or other surface at the expense of the Contractor, and may deduct the cost thereof from any money belonging to the Contractor in the control of the COUNCIL, or it may recover the cost in any court of competent jurisdiction from the bondsmen of the Contractor.

USE OF PRIVATE PROPERTY.

The Contractor shall not be allowed to use any private property as a depository for stone, sand, gravel, or other material without the written con-

sent of the owner or agent of the land, a copy of which shall be filed with the Engineer.

RAILROADS, OBSTRUCTIONS, ETC.

All railroads or other obstacles not required to be taken up must be kept in running order and good condition where practicable. No allowance will be made for delays or other damages occasioned by the necessity of keeping the railroads in constant running order, or for removing and replacing any obstructions.

EMPLOYES.

The Contractor shall employ capable superintendents or foremen to represent him on the work, and they shall receive and obey orders from the Engineer. The Engineer shall have authority to order the dismissal of any employe on the work who refuses or neglects to obey any of his instructions as to the carrying out of the provisions and intent of these specifications, or who is incompetent, unfaithful, abusive, threatening or disorderly in his conduct, and such person shall not be again employed on the work.

PATENTS.

All fees for any patented invention, article or arrangement that may be used upon or in any manner connected with the construction, erection or maintenance of the work, or any part thereof, embraced in the contract and these specifications, or other appurtenances, shall be included in the price stipulated in the contract for said work, and the Contractor must protect the CITY OF TAMA against any and all demands for such fees or claims, or from any future claims arising because of the use of any patented invention, process, article or arrangement.

EXTRAS.

No extras will be allowed or paid for unless they be ordered in writing by the Engineer. For extras so allowed the Contractor will be paid actual cost plus fifteen (15%) per cent for profit. The actual cost shall be the original cost and shall not consist of a sub-contractor's cost plus sub-contractor's profits, plus fifteen (15%) per cent.

No customary or trade measurements will be allowed, but all measurements shall be based on actual volume, lineal feet, square yards or other unit used in the bidding sheet and contract.

Alterations in the details of construction made during the process of the work shall not destroy the binding effect of the contract but such alterations shall be and become an integral part of the construction, and will not be paid for as extras unless it is manifestly impossible to consider them as units of work, the Engineer being the judge.

USE OF FIRE HYDRANTS.

Contractors desiring to use water from public hydrants shall make application to the proper authority, and in such cases shall conform to the rules and regulations of the CITY OF TAMA.

PREPARATION OF THE SUB-GRADE.

When filling is required it shall be of earth or cinders free from animal or vegetable matter, and shall be deposited in layers and thoroughly compacted.

In all cases where back-filling of curb is necessary it shall have at least a berm of at least four feet at the top thereof, with a slope of one and one-half horizontal to one vertical.

Where the earth adjacent to the back of the curb is above grade, it shall be removed so as to form a slope of one and one-half horizontal to one vertical, rising from the back of the curb to the surface of the ground.

Where cutting is required, the earth must be excavated to such a depth as may be necessary to bring the roadway to a proper sub-grade after being thoroughly compacted.

The Contractor shall remove all spongy material, or other inferior or vegetable matter that may be in the way of making this improvement.

All approaches connecting said street with other streets or alleys intersecting shall also be cut or filled so that the same shall have a slope of not more than one vertical to ten horizontal, and shall be secured from settlement adjoining the pavement.

The roadway shall be brought to the proper sub-grade by cutting or filling, and thoroughly com-

paoted and secured from further settlement by flooding, ramming or rolling, or all, as may be deemed necessary by the Engineer.

The Contractor shall bid with the express understanding that all necessary precautions must be used in preparing the sub-grade so as to support the pavement permanently, and so that the pavement will not sink thereafter, and at the expiration of five (5) years after the completion and acceptance of the work, will still be at the original grade.

This clause will not be waived on account of any trenches or holes made in the street by any corporation or private party prior to the laying of the pavement.

The price bid for cutting or filling, if in separate items, or the price per yard for paving, must include all cost of bringing the sub-grade to its proper position and compaction, and securing the same from settlement.

The roller used for compacting the sub-grade shall have a minimum weight of two hundred (200) pounds per lineal inch of width of wheel.

SHEETING AND BRACING FOR SEWERS.

To secure the protection of the work, the adjacent streets, buildings or other improvements, the Contractor shall furnish and put in place, at his own expense, braces, sheeting, etc., as may be necessary for the safety of the work, the public or adjacent property.

The sheeting and bracing shall be removed as the work progresses in such a manner as to prevent the caving in of the sides of the excavation or any damage to the masonry.

The Engineer may order the sheeting and bracing left in when in his opinion it is necessary for the protection of the work, the public or adjacent property. In such case only a charge will be allowed for the same at the rate of fifteen (\$15) dollars per thousand feet B. M.

The Contractor shall at his own expense shore up and restore and make good, as may be necessary, all fences, buildings, walls, conduits or other properties which may be disturbed during the progress of the work, and the said Contractor shall be held responsible for all damages which may happen to neighboring properties, or in any other way from neglect of this precaution.

The price per lineal foot of sewer shall include the cost of all excavation, all temporary supports and braces that may be necessary to secure a safe prosecution for the work until the permanent structure is completed. Such temporary supports must in all cases be removed by the said Contractor at his own expense after or concurrently with the completion of the permanent structure.

Where rock is encountered in excavating the trenches, it is to be removed by drilling and blasting, or otherwise, to the level of the outside of the bottom of the sewer. Wherever a water main, gas pipe or other conduit crosses the line of the trench, the rock on each side of the pipe for a distance of two (2) feet is to be removed without blasting. Where blasts are made the trench is to be carefully covered with suitable brush or timber or matting to prevent danger to life and property, and the Contractor must secure a permit for blasting. Before the sewer is built all irregularities of the rock are to be filled with sand and gravel, well rammed into place, without extra compensation.

For all rock excavation, in addition to the price per foot of sewer, the Contractor will receive a compensation of three (\$3) dollars per cubic yard. In estimating the number of cubic yards, an arbitrary width of the trench equal to the diameter of the sewer plus three (3) feet will be taken, which, multiplied by the depth from the surface of the rock to the bottom of the invert of the sewer or to the bottom of the rock strata where said strata does not extend to the bottom of the trench, will be considered the rectangular section upon which estimates of quantities will be based, no allowance being made for excavation beyond these boundaries and no deduction made for the portion which may not be removed. Boulders, one-quarter cubic yard and over in size, will be measured as rock excavation. Hardpan, shale which may be picked, stiff gravel and boulder clay shall not be classed as rock, although it may be more economical to remove same by blasting.

No claim for an amount of money beyond the contract price of the work will be entertained or allowed on account of the character of the ground in which the trench or other excavations are made, except for the rock cutting heretofore specified.

The Contractor must assume the risk of meeting quicksand, hardpan, boulder clay, etc., rubbish,

unforeseen obstacles, underground conduits, railroad tracks, pavements, etc.

All water, gas or other pipes or conduits shall be carefully supported and protected from injury by the Contractor, either until the sewer is built and the back-filling finished, or, if necessary, until the proper person removes or changes them. Nothing in this contract and specifications shall be so construed as to relieve any person or corporation, owning or using any pipes, conduits or tracks from the obligation to maintain and protect such pipes, conduits or tracks without any expense to the CITY OF TAMPA, or to the Contractor building said sewer.

All paving, graveling, macadamizing, planking, sidewalks, culverts and cross-walks, or any street paving whatever, shall be carefully removed before excavation is made, and kept separate from the other excavated material and carefully replaced after sewer is completed.

Tunnels should be of such width and height as the Engineer may direct and shall be excavated in conformity with the cross-section to be furnished by him.

FOUNDATIONS.

Wherever the ground is sufficiently firm and unyielding, the masonry or pipes shall be laid directly on the bottom of the excavation, but where this is not the case and such foundation is not shown on the plans, it shall be built of brick, concrete or of plank and timber, as the Engineer may direct.

The Contractor will be allowed extra compensation for this work at uniform prices named below for the different kinds of foundation required.

The following are the prices to be paid for the different kinds of foundation required, timber, sheeting, etc.:

Fifteen dollars (\$15.00) for 1,000 feet B. M. for plank and sheeting left in place by order of the Engineer.

Seven dollars (\$7.00) per cubic yard for concrete.

Eight dollars (\$8.00) per cubic yard for brick masonry.

PROTECTION AGAINST WATER.

The Contractor shall do all pumping and bailing, build all drains, and do all other work necessary

to keep the trench and sewer clear of ground water, sewage or storm water during the progress of the work, and until the cement mortar is sufficiently set to be safe from injury. To this end, in wet trenches, he shall keep a channel open at each side of the work during its construction, which shall be maintained so as to catch the water from the sides of the trench and to conduct it from a sufficient sump or bale-hole in front of the work.

When existing sewers have to be taken up or removed, the Contractor must provide and maintain temporary outlets and connections for all private and storm water which shall be received from these drains and sewers and discharge the same; and for this purpose he must provide and maintain, at his own expense, an efficient pumping plant and temporary outlet, and be prepared at all times to dispose of the water and sewage received from these temporary connections, until such time as the permanent connections shall be made by the Contractor, in a careful and workmanlike manner.

BACK-FILLING.

After any length of sewer is complete, the trench is to be filled to a height of not less than one (1) foot above the arch. As soon as the mortar is sufficiently set, the trench is to be sufficiently filled to prevent liability of injury to the banks, road surface, public or private. The trench shall be flooded with water and the back-filling completed.

The back-filling shall in all cases be left with a smooth and even surface and a sufficient crown. Where required the back-filling shall not be left unfinished more than six hundred (600) feet behind the completed masonry or pipe-work.

The surplus material taken from the trench is to be removed from the street or disposed of in such manner as directed, so as to save the CITY OF TAMA from all damages or expense on account thereof.

All rubbish must be removed and the surface of the street must be left in as good condition as it was before the commencement of the work.

Ditches shall be opened and connected to the sewer inlets hereinafter provided for, so as to provide for the adequate drainage of the surface of the adjacent lands and ditches.

FILLING.

The sewers shall in all cases be covered with earth to a depth of not less than three (3) feet, and where the trenches do not furnish sufficient material the Contractor shall supply such deficiency at his own expense.

When additional filling is required to be placed over the sewer for its protection, the Contractor shall furnish and spread earth, cinders, or clean sand, free from animal or vegetable matter, in such a manner and in sufficient quantity so that after it is thoroughly compacted the embankment will be of uniform grade and cross section.

RESTORATION OF THE SURFACE OF PAVED STREETS.

In all streets or parts of streets that are paved, graveled or macadamized, all the back-filling is to be well rammed with suitable tools in layers not exceeding twelve (12) inches in depth, provided the ground be clay, stiff loam, or of a tenacious nature. If the ground is sand or gravel, the back-filling is to be puddled. After being puddled or rammed to the required height the pavement shall be relaid carefully and thoroughly, in a manner adapted to its peculiar character and to the satisfaction of the Engineer.

When the work is completed all surplus material, earth, rubbish, etc., must be removed and the surface of the street included in this contract must be left in as good condition as it was before commencement of the work, and it must be maintained in such condition during a period of one (1) year after the acceptance of the work, or where the work specified herein is part of a paving contract, must be so maintained for a period of five (5) years.

CONNECTIONS OF OPENINGS.

It is hereby understood and agreed that the Contractor shall furnish, without extra compensation, except as hereinafter specified, all labor and materials necessary to connect and fit the new improvement with all the openings on the line thereof in connection with water, sewer, gas, electric conduits, etc., and shall bring the same to the proper grade, and in general shall do everything necessary

to render the work fully complete and ready for use.

No deductions will be made in calculating the final quantities for space occupied by the openings above specified or for any other unpaved space within the limits of this improvement, of less than one (1) square yard in area.

CEMENT -- GENERAL CONDITIONS.

All cement shall be inspected and shall be one of the following brands:-- Vulcanite, Alpha, Atlas, Chicago AA, Lehigh (Eastern), Pennsylvania or Wol-verine, or a brand which shall be acceptable to the Engineer and named in time to make seven (7) day test before shipment.

Cement may be inspected either at the place of manufacture or in the work. In order to allow ample time for inspection and testing, the cement shall be stored in a suitable weather tight building having the floor properly blocked or raised from the ground.

The cement shall be stored in such a manner as to permit easy access for inspection and identification for each shipment.

Every facility shall be provided by the Contractor and a period of at least twelve (12) days allowed for the inspection and necessary tests.

Cement shall be delivered in suitable packages with the brand and name of manufacturer plainly marked thereon.

A bag of cement shall contain ninety-four (94) pounds of cement net. Each barrel of Portland cement shall contain four (4) bags of the above net weight.

Cement failing to meet the seven-day requirements may be held awaiting the results of the twenty-eight day tests before rejection.

The sand used in making the concrete shall be coarse and sharp, evenly graded and of sizes ranging from one-quarter inch down to the finest. No wind drifted sand shall be used.

All tests shall be made in accordance with the methods proposed by the Committee on Uniform Tests of Cement of the American Society of Civil Engineers, presented to the Society, January 21, 1903, and amended January 20, 1904, and January 15, 1908, with all subsequent amendments thereto.

The Contractor shall provide the Engineer with a duplicate delivery ticket from each and every load of cement delivered on the work. The ticket must be signed by the consignor and be of a form approved by the Engineer.

The acceptance or rejection shall be based on the following requirements:

PORTLAND CEMENT.

Definition: This term is applied to the finely pulverized product resulting from the calcination to incipient fusion of an intimate mixture of properly proportioned argillaceous and calcareous materials and to which no addition greater than three (3) per cent has been made subsequent to calcination.

Specific Gravity.

The specific gravity of the cement, ignited at a low red heat, shall not be less than 3.10 and the cement shall not show a loss on ignition of more than four (4) per cent.

Fineness.

It shall leave by weight a residue of not more than eight (8) per cent on the No. 100 sieve, and not more than twenty-five (25) per cent on the No. 200 sieve.

Time of Setting.

It shall not develop initial set in less than thirty (30) minutes and must develop hard set in not less than one (1) hour nor more than ten (10) hours.

Tensile Strength.

The minimum requirements for tensile strenght for briquettes one inch square in section shall be within the following limits, and shall show no retrogression in strength within the periods specified:

<u>Neat Cement.</u>		
Age.		Strength.
24 hours in moist air	- - - - -	175 lbs.
7 days (1 day in moist air, 6 days in water)	- - - - -	500 lbs.
28 days (1 day in moist air, 27 days in water)	- - - - -	600 lbs.

One Part Cement. Three Parts Standard Sand.

Age.	Strength.
7 days (1 day in moist air, 6 days in water) - - - - -	-175 lbs.
28 days (1 day in moist air, 27 days in water) - - - - -	250 lbs.

Constancy in Volume.

Pats of neat cement about three (3) inches in diameter, one-half ($1/2$) inch thick at the center and tapering to a thin edge shall be kept in moist air for a period of twenty-four (24) hours.

(a) A pat is then kept in moist air at normal temperature and observed at intervals for at least twenty-eight (28) days.

(b) Another pat is kept in water maintained as near 70 degrees F. as practicable and observed at intervals for at least twenty-eight (28) days.

(c) A third pat is exposed in any convenient way in an atmosphere of steam, above boiling water, in a loosely closed vessel for five (5) hours.

These pats, to satisfactorily pass the requirements, shall remain firm and hard and show no signs of distortion, checking, cracking or disintegrating.

Sulphuric Acid and Magnesia.

The cement shall contain not more than 1.75 per cent anhydrous sulphuric acid (SO_3) nor more than 4 per cent of Magnesia (Mg.).

SEWER BRICKS.

The bricks shall be of the best quality for the purpose for which they are intended, uniform in quality, sound and hard burned, free from lime and cracks and have a clear ringing sound when struck, whole and with edges full and square and of standard dimensions; they shall be of compact texture and after being thoroughly dried and immersed in water for twenty-four (24) hours shall not absorb more than fifteen (15) per cent in weight of water.

MORTAR.

The mortar for brick work shall be made by carefully measuring and thoroughly incorporation one (1)

part of cement with three (3) parts of clean, sharp sand in dry state, mixed with clean water to the proper consistency, and shall be used while fresh, and the use of mortar which has set and then been retempered will not be allowed. The mortar used in laying pipe sewers shall consist of one (1) part of Portland cement and three (3) parts of clean sand mixed and used as above specified, all to be furnished by the Contractor without extra charge.

SEWER PIPE.

The pipe shall be straight, smooth and sound, thoroughly burned, well glazed, free from lumps or other imperfections, and with the least possible variation from the specified dimensions or true cylindrical shape. All straight pipe must be straight in the direction of the axis of the cylinder, with the ends cut at right angles with the axis of the pipe and inner and outer surface of each pipe must be concentric. The thickness of the pipe shall be:- for 15-inch pipe, 1-1/8 inches; for 12-inch pipe, 1 inch; for 9-inch pipe, 7/8 inch. When double strength pipe is specified, the standard thickness shall be one-twelfth (1/12) of the internal diameter of the pipe. The curves, slants and Y junctions must conform in all the foregoing requirements as regards quality, form and workmanship, and the thickness shall be equal to that of the same caliber into which the Y may be joined. All slant junctions and branch junctions shall be molded for an angle of thirty-four degrees (34°) with the sewer with which they are to connect.

PIPE LAYING.

Each pipe is to be laid on a firm bed, and in perfect conformity with the line and levels given by the Engineer. The ends of the pipe are to abut close against each other and in such a manner that there shall be no shoulder or want of uniformity of surface on the interior of the drain. The joints are to be as uniform as possible in thickness and thoroughly filled with mortar. Where the pipe is laid in sand, or in wet ground where water may be expected to be abundant, the joints must be calked with oakum. Each joint is to be wiped clean of mortar on the inside before another length of pipe is laid.

MANHOLES.

All manholes are to be circular in section and three (3) feet in internal diameter. They are to be built with two (2) rings of brick, giving a thickness of eight (8) inches to the wall. The bricks in the outside ring may be built of bats as far as broken bricks on hand will go. Otherwise whole bricks are to be used.

The invert of the sewer through the manholes shall be built of two (2) rings of brick, and on each side thereof shall be built a solid brick foundation twelve (12) inches thick, making the entire foundation four (4) feet and six (6) inches in diameter.

The top of the manhole is to be two (2) feet in diameter, being drawn in by means of six (6) header courses, the diameter being decreased two (2) inches for each course and an iron cover set thereon. On unpaved streets, the top of the covers of the manholes are to be at the surface of the streets, on paved streets to conform exactly to the surface of the adjacent pavement.

The price bid for manholes shall include the cost of manhole complete including cast iron cover.

VALVE BASINS.

Where directed by the Engineer, brick valve basins for gate valves of the same size and material as the sewer manholes shall be constructed, and the unit price for them shall be the same as that bid for the new manhole complete.

CATCH-BASINS.

All catch-basins are to be circular in section and three (3) feet six (6) inches in internal diameter. They are to be built of two (2) rings of brick upon a floor four (4) inches thick of Portland cement concret one-three-six (1-3-6) mix. The bricks in the inner ring (excepting the top and bottom courses) are to be set vertically. The outer ring may be built of bats as far as broken bricks on hand will go, otherwise whole bricks are to be used. The brick work shall be seven (7) feet three (3) inches deep. The top of the catch-basin shall be drawn into a rectangular shape by mean of twelve (12) header courses the size of the rectangle being

fifteen by twenty (15x20) inches. An iron cover shall be set thereon.

The catch-basins are to be connected with the sewer with 9-inch pipe.

The top of the cover shall be set at the grade given by the Engineer, and when so directed the Contractor shall set a piece of 9-inch pipe in the side of the basin at the proper elevation to receive the water from adjacent ditches.

CAST-IRON INLET GRATINGS.

Standard cast-iron inlet grating weighing 228 pounds and of form and dimensions shown on plans shall be furnished. The inlet grating is to be supported on a concrete foundation and connected to the catch-basin or drain by means of a 9-inch tile pipe in the manner shown on plans. The price bid per grating shall include the cost of all material and labor specified, except the tile pipe.

CATCH-BASIN COVERS.

Standard catch-basin covers made of the best quality cast-iron, weighing 150 pounds and of dimensions and design shown on plans shall be furnished and the cost included in the price bid for catch-basins.

MANHOLE COVERS.

The manhole covers shall be of the best quality of cast-iron and of the shape and size shown on the plans, and each weighing 340 pounds.

CAST-IRON CROSSING PLATES.

Cast-iron crossing plates shall be provided and set where shown on plans. They shall be of the best quality of cast-iron of a size and pattern as shown, and the price for furnishing and setting of these plates shall be included in the unit price for concrete curb. Approximately one hundred and thirty (130) lineal feet or 3,640 pounds of cast-iron plates shall be thus provided.

HEADERS.

At the end of each intersecting street and alley

wing there shall be placed a "Header" extending from curb to curb and so constructed as to conform to the surface of the pavement. The "header" shall consist of the same material as the concrete base and shall be built in monolithic connection therewith. It shall be six (6) inches wide and eleven (11) inches deep.

CONCRETE CURB.

A concrete curb shall be constructed at the established grade and in a continuous line on each side of the street, except at all intersections of streets and alleys where it shall be returned to the street line, and at such intersections there shall be formed the necessary circular stones built to such a radius as the Engineer may direct. All grades and lines will be given by the Engineer.

The curb shall be made of concrete formed by intimately mixing one (1) part of Portland cement with two (2) parts of coarse, sharp sand; to this mixture shall be added four (4) parts of washed gravel, which will pass a ring one and one-half (1-1/2) inches internal diameter and be held on a ring of one-fourth (1/4) inch internal diameter, and the whole thoroughly mixed together. Sufficient water to thoroughly wet the mass shall then be added and the whole thoroughly mixed. The mixture shall be placed immediately in forms and rammed until moisture flushes to the top. The forms shall remain in place at least twenty-four hours after the mixture is placed therein, or as much longer as the Engineer shall direct.

The curb shall be twenty-four (24) inches in depth and six (6) inches thick throughout, except at the upper face corner, which must be rounded to a radius of one and one-half (1-1/2) inches.

The exposed surface of the curb shall be covered with a finishing coat of Portland cement mortar one-half (1/2) inch in thickness. The finishing coat shall be a mortar composed of one (1) part of Portland cement thoroughly mixed with one and one-half (1-1/2) parts of clean, coarse sand. Before the concrete sets, the curb shall be cut into sections not exceeding six (6) feet in length by means of steel or wrought iron plates one-eighth (1/8) inch thick.

Where the Engineer has directed that cross-walks be formed in the pavement the Contractor shall build,

without extra charge, a false gutter and concrete header all in monolithic construction with concrete curb as shown on plans.

The barrows or appliances used in measuring the parts of cement, etc., shall be of such size and shape as may be approved by the Engineer.

The curb shall be back-filled to the top, and filling at that point shall be level and four (4) feet wide and then shall have a slope of one and one-half (1-1/2) horizontal to one (1) vertical.

The price bid per lineal foot for concrete curb must include all cost of grading, header curb, false gutter and cast-iron crossing plates.

CONCRETE FOUNDATION.

On the sub-grade as above prepared shall be laid a foundation of Portland cement concrete to a uniform thickness of five (5) inches. The concrete shall be made of Portland cement and sand in combination with stone or gravel.

The sand used in making the concrete shall be of sizes ranging from one-quarter (1/4) inch down to the finest, and shall be free from dirt, dust and other impurities. No wind drifted sand shall be used.

The stone or gravel used in making the concrete shall be of the best quality of each of the respective materials to be used, clean, free from dust and shall be of variable sizes, which will pass a ring of two (2) inches in internal diameter and be held on a ring of one-fourth (1/4) inch internal diameter.

The concrete shall be mixed by approval batch machine mixers or on movable, tight iron platforms of such size as to accommodate the manipulations specified. The cement, sand and stone or gravel shall be mixed in the following proportions by volume. One (1) part of cement, three (3) parts of sand and six (6) parts of stone or gravel. The sand and cement shall be thoroughly mixed dry, after which water shall be added and the mixture made into a stiff mortar. The stone or gravel shall be immediately incorporated in the mortar and the mass thoroughly mixed, water being added if necessary as the mixing progresses, until each particle of stone or gravel is covered with mortar. One (1) barrel of cement shall be used for each seven and one-half (7-1/2) square yards of foundation.

The barrows or appliances used in measuring the parts of cement, sand, stone or gravel shall be of such size and shape as may be approved by the Engineer.

The sand, stone or gravel, when delivered on the street, shall be kept clean until used, and where there is no clean paved surface for storing these materials shall be placed upon temporary plank flooring, if so ordered by the Engineer.

The concrete shall be deposited in a layer on the sub-grade in such quantities that, after being thoroughly rammed in place, it will be of the required thickness and the upper surface will be true and uniform and six (6) inches below and parallel with the surface of the pavement.

In hot weather the concrete shall be kept moist so as to prevent checking. It shall be protected from injury and shall lay at least seven (7) days before being covered with the brick or a longer time if deemed necessary by the Engineer.

SAND CUSHION.

Upon the concrete foundation shall be spread a layer of coarse sand free from loam and dirt and in such quantities as to insure, when compacted, a uniform thickness of two (2) inches. In surfacing said layer of sand the Contractor shall use such grades and templets as the Engineer may direct. The sand used shall be of the same quality as that used in concrete; it shall be moist when used and shall be compacted by means of an approved hand roller until it assumes a true and unbroken surface.

BRICK WEARING SURFACE.

Upon the sand cushion shall be set the paving brick.

The brick shall be of a kind known as repressed vitrified paving brick, or No. 1 vitrified brick paving block, and shall be thoroughly annealed, tough and durable, regular in size and shall be evenly burned. When broken the brick shall show a dense and stone-like body, uniform in color inside, free from lumps or uncrushed clay, lime, air pockets, cracks or marked laminations. Kiln marks or surface cracks must not exceed three-sixteenths (3/16) of an inch in depth.

The dimensions of the brick shall be the same throughout the entire work, and shall not be less than eight (8) inches in length, four (4) inches in depth and three and one-half ($3\frac{1}{2}$) inches in thickness, with edges rounded to a radius of one-quarter ($\frac{1}{4}$) inch.

TESTS.

The Contractor shall furnish and deliver by express without extra cost to the Engineer, at any laboratory designated by him, such sample brick for testing as he may select. The Contractor will not be required to furnish more than twenty (20) sample bricks for each thousand yards of pavement, provided that not less than twenty (20) sample bricks are furnished on any one contract.

The sample brick shall be subjected to the following test for loss by abrasion in a standard rattler as recommended by the Association for Standardizing Paving Specifications in its second annual report.

All tests shall be made on charges containing but one (1) make of brick at a time. The brick charge will consist of ten (10) paving blocks. No blocks will be accepted for this test that would be rejected by any other requirements of these specifications.

The rattler shall be revolved at a uniform rate of not less than twenty-nine and one-half ($29\frac{1}{2}$) nor more than thirty and one-half ($30\frac{1}{2}$) revolutions per minute for eighteen hundred (1800) revolutions, and the loss of weight by abrasion during such test shall not exceed twenty-one (21) per cent of the original weight of the brick tested. Such brick shall be thoroughly dried before weighing for the test.

LAYING WEARING SURFACE.

The brick shall be delivered to the setter on pallets with clamps, or by means of roller conveyors, not wheeled with barrows or dumped.

The brick shall be set on edge, close together, in straight lines across the roadway between gutters, and at right angles to the curbs. Gutters shall be constructed as directed by the Engineer. The joints shall be broken by a lap of not less than three (3) inches.

On intersections and junctions of lateral streets, the brick shall be laid at an angle of forty-five (45) degrees with the line of the street, unless

otherwise ordered by the Engineer.

The brick when set, shall be rolled with a self-propelling roller weighing not less than five (5) tons, until firmly bedded and brought to a uniform and even surface. Or, if the Engineer so directs, the brick, when set, shall be thoroughly rammed two or more times, the ramming to be done under a flat-ter, with a paving rammer weighing not less than thirty (30) pounds, the iron of the rammer face in no case to come in contact with the pavement.

After rolling or ramming, all imperfect brick found in the pavement must at once be removed and replaced by sound and perfect brick.

Care should be used in handling the brick to prevent unnecessary chipping or breaking. Broken brick can only be used to break joints in starting courses and in making closures.

In no case will teams be allowed on the work before the wearing surface is rolled.

EXPANSION JOINTS.

Expansion joints one and one-half (1-1/2) inches in width shall be placed along the gutter adjoining the roadway face of the curb. These joints shall be filled with paving pitch which is the direct result of the distillation of "straight run" coal tar, and of such quality and consistency as will be approved by the Engineer. The pitch must be used at a temperature of not less than three hundred (300) degrees Fahr. and not more than three hundred and fifty (350) degrees Fahr. and be spread in section if the Engineer so directs.

The pitch shall contain not less than fifteen (15) per cent nor more than thirty-five (35) per cent of free carbon, and shall have a melting point at a temperature of not less than one hundred and thirty (130) degrees and not more than one hundred and forty (140) degrees Fahr.

The pavement must be kept clear of traffic for a period of seven (7) days, or as much longer as the Engineer may direct, after the application of the cement grout.

CEMENT GROUT FILLER.

After such rolling the surface of the pavement shall be swept perfectly clean and the joints between the blocks shall be filled with Portland

cement grout which shall be composed of one (1) part each of clean, sharp sand and Portland cement. The sand shall be dry. The mixture, not exceeding one-third ($1/3$) bushel of the sand, together with a like amount of cement, shall be placed in the box, and mixed dry, until the mass assumes an even and unbroken shade. The water shall be added, forming a liquid mixture of the consistency of thin cream.

The side and edges of the brick shall be thoroughly wet before the filler is applied by being sprinkled.

From the time the water is applied until the last drop is removed and floated into the joints of the brick pavement, the mixture must be kept in constant motion.

The mixture shall be removed from the box to the street surface with a scoop shovel, all the while being stirred in the box as the same is being emptied. The box for this purpose shall be four (4) feet eight (8) inches long, thirty (30) inches wide and fourteen (14) inches deep, resting on legs of different lengths, so that the mixture will readily flow to the lower corner of the box, the bottom of which shall be six (6) inches above the pavement. This mixture, from the moment it touches the brick, shall be thoroughly swept into the joints.

Two (2) such boxes shall be provided in case the street is twenty (20) feet in width; exceeding twenty (20) feet in width, three (3) such boxes shall be used.

The work of filling shall thus be carried forward in line until an advance of fifteen (15) to twenty (20) yards has been made, when the same force and appliances shall be turned back and cover the same space in like manner, except to make the proportions two-thirds ($2/3$) Portland cement and one-third ($1/3$) sand.

To avoid the possibility of thickening at any point, there shall be a man with a sprinkling can, the head perforated with small holes, sprinkling gently the surface ahead of the sweepers.

Within one-half ($1/2$) to three-quarters ($3/4$) of an hour after this last coat is applied and the grout between the joints has fully subsided and the initial set has taken place, the whole surface must be slightly sprinkled and all surplus mixture left on the tops of the brick swept into the joints bringing them up flush and full.

After the joints are thus filled flush with the top of the brick and sufficient time for hardening has elapsed, sprinkling sufficient to dampen the surface shall be done at intervals of six (6) hours for three (3) days.

The pavement must be kept clear of traffic for a period of seven (7) days or as much longer as the Engineer may direct, after the application of the cement grout.

All of said work shall be done in a workmanlike manner under the supervision of the Engineer in charge.

CONTRACTOR'S CERTIFICATE.

The undersigned hereby certifies that he has read the foregoing specifications and that his proposal for the work is based on the conditions and requirements embodied therein, and should the contract be awarded to him he agrees to execute the work in strict accordance herewith.

Name - - - - -

Residence - - - - -

Name - - - - -

Residence - - - - -

Name - - - - -

Residence - - - - -

LEGAL FORMS RELATIVE TO PAVING
IN THE CITY OF TAMA, IOWA.

RESOLUTION RELATIVE TO SEWER AND WATER CONNECTIONS.
Provided for in the Code Section 809.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY
OF TAMA, IOWA:

That notice be at once given by publication to all parties to make connections with the sewer and water mains on that part of THIRD Street beginning at the west side of SIEGEL Street and thence extending east to the east line of STATE Street; also on that part of FOURTH Street beginning at the west line of SIEGEL Street and thence extending east to the east side of STATE Street; also on that part of SIEGEL Street lying between the south track of the Chicago and Northwestern Railway and the north track of the Chicago, Milwaukee and St. Paul Railway; also on that part of McCLELLAN Street lying between the south track of the Chicago and Northwestern Railway and the north track of the Chicago, Milwaukee and St. Paul Railway; also on that part of STATE Street lying between the south track of the Chicago and Northwestern Railway and the north track of the Chicago, Milwaukee and St. Paul Railway; to make all connections with sewer and water mains not later than September First, 1913, and in case the property owners fail to do so within the time prescribed herein, the City shall proceed to make the connections and shall collect the costs of so doing from the property owners as provided by Section 809 of the Code of Iowa, of the year 1897, and supplements, revisions and substitutions thereof.

That all connections to the water main shall be in strict accordance with Ordinance No. 90 of the Ordinances of the City of Tama, Iowa.

That all connections with the sewer main shall be of the best quality of vitrified earthen-ware pipe, with properly cemented joints, and the same shall be laid not less than five (5) feet below the surface of the ground, and in accordance with the Ordinances of the City of Tama, Iowa, relating to sewers.

That all the above is in view of the anticipated pavement which will be ordered constructed upon said streets and avenues as above described.

That the City Clerk be and he is hereby ordered and directed to cause this resolution to be published in at least one newspaper of the City of Tama, Iowa, in the issue of June 19th, 1913, as to notice to property owners whose property abuts upon any part of the streets and avenues first herein described as ordered paved.

That it shall be the duty of the City Marshal to read a copy of this resolution to each and every property owner whose property abuts upon any part of the streets and avenues as above described, which reading shall serve as further notice to such property owners. It shall then be the duty of the City Marshal to make proper return of such notices to this Council.

SEAL.

C. J. WONSER

Mayor.

T. M. McCURDY

Clerk.

Passed June 16, 1913.

Published June 19, 1913.

--O--O--O--O--O--O--

RESOLUTION AUTHORIZING AND DIRECTING THE MAYOR AND CITY CLERK TO ENTER INTO A CONTRACT WITH THE AETNA ENGINEERING BUREAU, FOR PERMANENT STREET IMPROVEMENT ON STATE STREET.

WHEREAS, the City of Tama, Iowa, contemplates the construction of paving upon and along certain portions of STATE Street in Tama, Iowa:

WHEREAS, it is deemed advisable that an Engineer be employed to draw plans and specifications and do further engineering work relative to said improvement:

WHEREAS, the City Council has before it a contract in blank form from the Aetna Engineering Bureau:

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TAMA, IOWA:

That it is the desire of this Council that the

City of Tama, Iowa, enter into the contract submitted by the Aetna Engineering Bureau at this meeting, such contract covering the employment of engineers to draw plans and specifications and do further engineering work relative to said improvement; that the Mayor and City Clerk are hereby authorized, directed and instructed to enter into a contract with the Aetna Engineering Bureau on behalf of the City of Tama, Iowa, (such contract to be the same as the contract now before this Council) and that the Mayor and City Clerk are further authorized, directed and instructed to execute, sign, seal and deliver said contract to the said Aetna Engineering Bureau.

Passed this 5th, day of January, 1914.

ATTEST:

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

--O--O--O--O--O--O--

CONTRACT.
(Copy)

The agreement made this 8th day of January, 1914, by and between the City of Tama, Iowa, party of the first part, and the Aetna Engineering Bureau, of Chicago, Illinois, a co-partnership, party of the second part, Witnesseth:

That the said Aetna Engineering Bureau is to furnish to and for the City of Tama, Iowa, complete plans and specifications for a system of street pavement covering the streets designated by the City Council of Tama, Iowa, and drafts of all resolutions, ordinances and legal forms to be used by the said City of Tama, Iowa, in the progress of the construction of said work; also, the said Aetna Engineering Bureau is to have complete engineering supervision of said contemplated work of paving and hereby agrees to place a competent Engineer on said work who is experienced and understands the work of paving and keep said Engineer in the City of Tama during the entire progress and construction of said work to inspect and direct the work and to settle

all points of dispute that might arise with reference to said work between the Contractor who does the same and the City Council of Tama, Iowa.

If the resident Engineer furnished by said Engineering Bureau is for any reason unsatisfactory to said City, on objection being made by said City, he will be withdrawn by said Engineering Bureau and another furnished.

It is further understood that W. W. Marr of the Aetna Engineering Bureau shall come to Tama to inspect the work of paving after the contract is let and work is commenced thereon once in two weeks or oftener if in the judgment of the City Council of Tama it shall be necessary, and to ascertain whether or not the same is being constructed in a first class manner, and the material being furnished therefor is of proper and necessary grade for the proper construction of the work, and in accordance with the contract and specifications.

It is further understood and agreed that the said Aetna Engineering Bureau is to furnish complete, thorough and satisfactory inspection, engineering and advise in the direction of the work so as to insure that the same will be completed in a thorough, proper and satisfactory manner.

It is further understood that W. W. Marr of the Aetna Engineering Bureau, is to be present in Tama at the time the bids of Contractors on said work are to be opened and advise the said City as to the advisability of accepting or rejecting any bid made on the same.

It is further understood and agreed that the said City of Tama is to pay to the said Aetna Engineering Bureau four and one-half per cent of the cost of said paving contract, one per cent of which is to be paid when the plans, estimate and specifications for the said work of paving are completed and accepted by the City of Tama, and the balance is to be paid in accordance with the monthly estimates of the construction of said work made by the said Aetna Engineering Bureau for the Contractor, and the last payment is to be made thirty (30) days after said work is fully completed and accepted by the City of Tama, Iowa.

In Testimony Whereof, the parties hereto have hereunto set their hands this 8th day of January, 1914.

THE CITY OF TAMA, IOWA

(CITY SEAL) By C. J. WONSER,
Mayor

ATTEST: T. M. McCURDY
City Clerk.

PARTY OF THE FIRST PART.

(CLERK'S SEAL)

AETNA ENGINEERING BUREAU

By Wm. W. MARR
PARTY OF THE SECOND PART.

STATE OF IOWA :
: SS:
TAMA COUNTY :

Be it remembered that on this 8th day of January, A. D. 1914, personally appeared before me, C. J. Wonser and T. M. McCurdy, to me personally known to be the Mayor and Clerk, respectively, of the Incorporated City of Tama, Tama County, Iowa, and each of them being first duly sworn did say and each for himself says, that he is the Mayor and Clerk, respectively, of the said Incorporated City of Tama, Tama County, Iowa, a Municipal Corporation, and that the seal affixed to said instrument is the seal of said Municipal Corporation and that said instrument was signed and sealed in behalf of said Corporation by authority of the City Council of said Incorporated City of Tama, Tama County, Iowa, and the said C. J. Wonser and T. M. McCurdy, as officers respectively, acknowledge said instrument to be the voluntary act and deed of said Municipal Corporation.

(SEAL) MARK W. HYLAND
Notary Public in and
for Tama County, Iowa.

PROPOSED RESOLUTION OF NECESSITY

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TAMA, IOWA,

That it is deemed advisable and necessary to improve by curbing, draining and paving the following streets, parts of streets, avenues and alleys, in the City of Tama, County of Tama, and State of Iowa, TO WIT:

THIRD STREET: from the westerly line of Siegel Street to the west line of Harmon Street;

FOURTH STREET; from Siegel Street to the west line of Harmon Street;

SIEGEL STREET: from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and Saint Paul Railway;

MOCLELLAN STREET: from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and Saint Paul Railway;

STATE STREET: from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and Saint Paul Railway; and also the roadways of all intersecting streets and alleys extended from the curb line to the street line produced on each side of said above specified streets between the limits above described.

That all of said paving is to be laid on motion of the City Council of Tama, Tama County, Iowa, without petition.

That said improvement is to be constructed of one or more of the following kinds of paving, the particular kind or kinds to be used to be selected by the City Council after all bids have been received:

Constructing necessary vitrified tile pipe drains; constructing necessary sewer manholes, catch-basins, and inlets for connecting gutters and drains;

constructing gravel concrete curb and paving with repressed vitrified brick paving blocks, or with Number One vitrified brick paving blocks, on two (2) inches of sand and five (5) inches of Portland cement concrete, joints of brick filled with Portland cement grout. All of said curbing, draining and paving to be done in accordance with plans and specifications to be presented by the AETNA ENGINEERING BUREAU and approved by the City Council.

BE IT FURTHER RESOLVED, that the cost and expense of such improvement be assessed against all lots and parcels of land according to area so as to include one-half of the privately owned property between the streets improved and the next street whether such privately owned property abut upon said street or not, but in no case on privately owned property situated more than three hundred (300) feet from the street improved, and against railway and street railways having tracks thereon, in proportion to the benefits accruing thereto and in accordance with the law governing such assessment including the cost and expense of said improvements at the intersection of streets, highways, avenues and alleys. Pavements, the cost of which property owned by the City of Tama, Tama County, Iowa, would be liable, and any deficiency where the special assessment which may be levied against any lot or tract of land shall be insufficient to pay the cost of the improvement, shall be paid from the City Improvement Fund, to be raised by means of Special Levy on all property in the City of Tama, Tama County, Iowa, and to be made to extend not more than ten (10) years, said levy to be made in accordance with Section 830 of the Code of Iowa and as by law provided.

That the contract for making of said improvement shall contain a provision obligating the Contractor and his bondsman to keep such improvement in good repair for five (5) years after the acceptance by the City.

BE IT FURTHER RESOLVED, that the City Council shall meet at EIGHT o'clock P. M. on the Eighteenth day of March, 1914, in the Council Chambers in the City of Tama, Tama County, Iowa, for the purpose of considering objections to the passage of said proposed resolution or to the construction of said improvement, at which time the above resolution may be amended and passed, or passed as proposed.

BE IT FURTHER RESOLVED, that the City Clerk be and is hereby directed to cause notice of the pendency of the above resolution and the time at which the said proposed resolution will be considered by this Council and the objections to the passage thereof heard, to be published as by law provided in one or more newspapers of general circulation, published in the City of Tama, Tama County, Iowa.

Filed this SECOND day of February, 1914.

T. M. McCURDY,
City Clerk.

C. J. WONSER,
Mayor.

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NOTICE OF INTENTION TO PAVE CERTAIN
STREETS IN THE CITY OF TAMA, IOWA.

Notice is hereby given that at a meeting of the City Council of the City of Tama, Iowa, held on the Second day of February, 1914, there was introduced the resolution hereinafter set forth and that by resolution of the City Council duly passed on said day, the said resolution hereinafter set forth, will be considered by the City Council for passage at a meeting to be held in the Council Chamber in said City at EIGHT o'clock P.M. on the Eighteenth day of March, A.D. 1914, at which time the owners of property abutting on the streets described in said resolution, or between the street improved and the next street and within three hundred (300) feet of the street or streets improved described in said resolution subject to assessment for the cost of the improvement contemplated by said resolution, may appear before the said City Council and make objections to the contemplated improvement and the passage of said proposed resolution, if any they have, the said Resolution of Necessity being as follows:

(For said Resolution of Necessity, see Page 57)

IN WITNESS WHEREOF, I have hereunto affixed my hand and the seal of the City of Tama, Iowa.

(SEAL)

T. M. McCURDY

City Clerk of the City of Tama, Iowa.

Published February 5, 12, 19, 26.

RESOLUTION DIRECTING THE AETNA ENGINEERING BUREAU, CIVIL ENGINEERS, TO PREPARE PLANS AND SPECIFICATIONS.

WHEREAS, On the Second day of February, 1914, there was proposed for passage by the City Council of Tama, Tama County, Iowa, a Resolution of Necessity providing for the street improvement on the following streets and parts of streets, TO WIT:-

Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same; and,

WHEREAS, on the Eighth day of January, 1914, the City of Tama, Tama County, Iowa, by the Mayor and Clerk of said City, duly authorized and directed by the City Council of the City of Tama, Tama County, Iowa, did on behalf of the said City of Tama, Tama County, Iowa, enter into a contract with the Aetna Engineering Bureau of Chicago, Illinois, whereby the said Aetna Engineering Bureau was to prepare plans and specifications for the street improvement herein described, THEREFORE:

BE IT RESOLVED BY THE CITY COUNCIL OF TAMA, TAMA COUNTY, IOWA,

That the Aetna Engineering Bureau be and is hereby directed to prepare plans and specifications for the construction of the said street improvements and to submit the same to the City Council at a meeting to be held on the Second day of March, 1914.

Introduced by Councilman _____

ROLL CALL.

Councilman B. Thompson _____

Councilman E. B. Sperry _____

Councilman Harry King _____

Councilman W. E. Fowler _____

Councilman _____

Passed this Second day of February, 1914.

ATTEST:

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

RESOLUTION OVERRULING OBJECTIONS
AND ORDERING STREET IMPROVEMENT.

WHEREAS, on the second day of February, A.D. 1914, there was proposed for passage by the City Council of Tama, Iowa, on its own motion, the following Resolution of Necessity, TO WIT: (For said Resolution of Necessity, see Page 57), and,

WHEREAS, the said City Council met in accordance with the said Proposed Resolution of Necessity and the notice thereof, and has given hearing to all objections to the contemplated improvement, THEREFORE:

BE IT RESOLVED BY THE CITY COUNCIL OF TAMA, TAMA COUNTY, IOWA:

That all objections to the contemplated improvement be and the same are hereby overruled, and

BE IT FURTHER RESOLVED, that the Resolution of Necessity above set forth be and the same is hereby adopted as proposed and the said street improvement ordered in accordance therewith, and,

BE IT FURTHER RESOLVED, that the contract for said improvement specify that when the said street improvement as contracted for has been completed and accepted by the City Council the cost and expense of said street improvement, except such part thereof as shall be payable from the City Improvement Fund, shall be assessed against all lots and parcels of land according to area so as to include one-half of the privately owned property between the street improved and the next street, whether such privately owned property abut upon said street or not, but in no case on privately owned property situated more than three hundred (300) feet from the street improved, and against railway and street railways having tracks thereon, in proportion to the benefits accruing thereto and in accordance with the law governing such assessment including the cost and expense of said improvements at the intersections of streets, highways, and avenues, and the City shall issue bonds for such part of said assessment as shall not be paid in cash, and as soon as such bonds shall be negotiated the Contractor shall receive payment on the contract to the amount, plus legal interest, in which the lots and parcels of land so assessed was assessed thereon, but no money shall be due under the contract on that

portion payable from the assessment against the lots and parcels of land so assessed until the said bonds are issued and negotiated as by law provided, or the City has had reasonable time so to do; said street improvements, the cost of which property owned by the City of Tama, Tama County, Iowa, would be liable, and any deficiency, where the special assessment which may be levied against any lot or parcel of land shall be insufficient to pay the cost of the improvements shall be paid from the City Improvement Fund by means of a special levy on all property in Tama, Tama County, Iowa, to be made to extend over a period of ten (10) years, said levy to be in accordance with Section 830 of the Code of Iowa, and as by law provided, and when said street improvement as contracted for has been completed and accepted by the City Council said levy will be made and bonds, drawing six (6) per cent interest issued against the same and said bonds to the amount which under the contract he is entitled to receive from the City Improvement Fund, transferred to the Contractor, or the City may, at its option, negotiate said bonds and make payment to the Contractor out of the proceeds therefrom and the City shall have a reasonable time so to do;

That the Contractor shall look exclusively to the funds stated in the contract for the payment of said street improvement, and the City of Tama, Tama County, Iowa, will not make itself pecuniarily liable for the payment of the cost of any part of the same and will not incur any indebtedness therefor;

That said street improvement shall be commenced on or before the FIFTEENTH day of May, A. D. 1914, and shall be completed on or before the FIRST day of September, A. D. 1914, and shall be kept in repair at the expense of the Contractor for five (5) years from the date of its acceptance by the City Council.

PASSED March 18th, 1914.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

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RESOLUTION DIRECTING THE CITY CLERK TO
ADVERTISE FOR BIDS.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY

OF TAMA, IOWA:

That the City Clerk be and he is hereby directed to advertise, as by law provided, for bids for the construction of street improvement on the following streets and parts of streets, TO WIT:- Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same, as contemplated in the resolution ordering said improvement, passed this Eighteenth day of March, 1914, said bids to be opened at the City Hall at TWO o'clock P. M. on the Fourteenth day of April, 1914, and acted upon by the City Council at a Council meeting to be held at EIGHT o'clock P. M. on the same day.

PASSED March 18, 1914.

C. J. WONSER

Mayor

T. M. McCURDY

City Clerk.

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ADVERTISEMENT FOR BIDS FOR CONSTRUCTION
OF STREET IMPROVEMENT.

Sealed proposals will be received at the office of T. M. McCURDY, the City Clerk of Tama, Iowa, until TWO o'clock P.M. on the Fourteenth day of April, A. D. 1914, for furnishing labor and materials for street improvement on the following streets and parts of streets, TO WIT:- Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same.

Said paving shall be constructed of one or more of the following kinds of paving, the particular kind or kinds to be used to be selected by the City Council after all bids have been received:

Repressed vitrified brick paving blocks or Number One vitrified brick paving blocks, on two (2) inches of Portland cement concrete, joints of brick filled with Portland cement grout, and said curbing to be constructed of Portland cement concrete and to be twenty-four (24) inches in depth and six (6) inches thick throughout, except at the upper face corner, which must be rounded to a radius of one and one-half

(1-1/2) inches, all of which said grading, curbing and paving shall be done in accordance with plans and specifications thereof of the Aetna Engineering Bureau, now on file with the City Clerk, which plans and specifications are by reference made a part of this advertisement.

The following is an approximate estimate of the work to be done:

14,500	square yards brick pavement
4,800	lineal feet curb
800	lineal feet 12-inch tile pipe sewer
800	lineal feet 9-inch tile pipe sewer
4	manholes
13	catch-basins
21	inlets
4,400	cubic yards excavation

All bids must be accompanied in a separate envelope by a certified check payable to the order of the City Treasurer in the sum of Three Thousand Dollars (\$3,000.00), as security that the bidder will enter into the contract for the construction of the contemplated street improvement and will give bond as required.

(See latter part of preceding Resolution, beginning with "BE IT FURTHER RESOLVED, that the contract for said improvement specify that" etc., Page 61.)

That the Contractor shall give good and sufficient bond in the sum of \$30,000.00, to be approved by the City Council, obligating the Contractor and his bondsmen to faithful performance of the contract and to keep the said street improvement in good repair for a period of five (5) years after the acceptance of same by the Council.

Bids will be publicly opened at the City Hall at TWO o'clock P. M. on the Fourteenth day of April, A.D. 1914, and the City Council will act thereon at a Council meeting to be held at EIGHT o'clock P. M. on the same day, and will let the contract in the name of the City to the lowest bidder, but all bids may be rejected.

Bids must be printed on blanks, which may be had from the City Clerk on request.

Dated this 23rd day of March, 1914. T. M. McCURDY
 Published March 26 and April 2, 1914. City Clerk of
 Tama, Ia.

BIDS SUBMITTED - APRIL 14TH 1914

CONTRACTORS

QUANTITIES	ORIGINAL ESTIMATE & UNIT PRICES		THOS CAREY & SONS CLINTON Ia.	* J.W. TURNER IMP. CO. DES MOINES Ia.	RE. SHUGART NEVADA Ia	DEARBORN CONSTRUCTION WATERLOO Ia	C. B. McMANAM DUBUQUE Ia.	PUBLIC SERVICE CONSTRUCTION CO OMAHA NEB.	Wm. Harpootian IOWA CITY Ia	FORD PAVING CO. CEDAR RAPIDS
4400 cu yds. EARTH EXCAVATION	.50	2200	.40 1760	.40 1760	.40 1760	.42 1848	.40 1760	.40 1760	.45 1980	.48 2112
800 lin. ft. 9" Tile Sewer	.90	720	.40 320	.75 600	.70 560	.55 440	.75 600	.60 480	.80 640	1.15 920
800 lin. ft. 12" Tile Sewer	1.10	880	.50 400	.83 664	.85 680	.75 600	.85 680	.65 520	.80 640	1.25 1000
21 INLETS	20.00	420	8.00 168	13.00 273	16.50 346.50	12.50 262.50	15.00 315	10.00 210	25.00 525	23.50 493.50
4 MANHOLES	35.00	140	28.00 112	39.00 156	38.00 152	30.00 120.00	25.00 100	25.00 100	40.00 160	25.00 100
13 CATCH BASINS	40.00	520	35.00 455	45.00 585	42.00 546	26.00 338	22.00 286	30.00 390	25.00 325	25.00 325
4800 lin. ft. CONCRETE CURB	.45	2160	.40 1920	.49 2352	.40 1920	.485 2328	.40 1920	.40 1920	.45 2160	.45 2160
14,500 Sq yds. REPRESSO VIT. BRICK PAVE	2.00	29000	1.89 27405	1.89 27506.50	1.86 26970	1.87 27115	2.05 29725	1.96 28420	1.98 28710	1.93 27985
TOTAL	\$36040		\$32540	\$33896.50	\$32934.50	\$33051.50	\$35386	\$33800	\$35120	\$35095.50

* CONTRACT AWARDED TO

611
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TO THE HONORABLE MAYOR AND CITY COUNCIL OF
TAMA, IOWA:

Gentlemen:-

The undersigned, members of the committee on streets and alleys, having publicly opened at the City Hall, at TWO o'clock P.M., this Fourteenth day of April, A. D. 1914, the bids for the street improvement heretofore ordered on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same, beg leave to report as follows:

Bids in proper form and accompanied by the certified checks, as specified in the advertisement for bids, were received from the following parties and were as follows:-

- | | |
|---|-------------|
| 1. Thomas Carey & Sons,
Clinton, Iowa. | \$32,540.00 |
| 2. J. W. Turner Improvement Co.,
Des Moines, Iowa. | \$33,896.50 |
| 3. P. E. Shugart,
Nevada, Iowa. | \$32,934.50 |
| 4. Dearborn Construction Co.,
Waterloo, Iowa. | \$33,051.50 |
| 5. C. B. McNamara,
Waterloo, Iowa. | \$33,386.00 |
| 6. Public Service Construction Co.,
Omaha, Nebraska. | \$35,800.00 |
| 7. Wm. Horraben,
Iowa City, Iowa. | \$35,120.00 |
| 8. Ford Paving Co.,
Cedar Rapids, Iowa. | \$35,095.50 |

The bid of Thomas Carey & Sons, Clinton, Iowa, being the lowest bid, your committee respectfully recommends that said bid be accepted and all others rejected.

B. THOMPSON, Chairman.

E. B. SPERRY

W. E. FOWLER

Committee on Streets and Alleys.

RESOLUTION AWARDDING CONTRACT.

WHEREAS, there has been filed by the committee on streets and alleys of the City Council of Tama, Iowa, a report showing that said committee publicly opened at the City Hall, at TWO o'clock P. M., this Fourteenth day of April, A. D. 1914, the bids for the street improvement heretofore ordered on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same;

and recommending that the bid of ... THOMAS CAREY and SONS, of CLINTON, IOWA, of \$32,540.00 ... being the lowest bid be accepted, and all others rejected; which report has been accepted and ordered placed on file, now, THEREFORE:

BE IT RESOLVED BY THE CITY COUNCIL OF TAMA, IOWA, that the Mayor and City Clerk be and they are hereby authorized and directed to enter into a contract in the name of the City with Thomas Carey and SONS, of CLINTON, IOWA, according to the advertisements for bids; said contract, before being signed in the name of the City, to have thereon the approval of Wm. W. Marr, of the Aetna Engineering Bureau, and the City Solicitor.

BE IT FURTHER RESOLVED, that the City Clerk be and he is hereby directed to return to each of the other bidders for the contract for this street improvement his certified check.

Passed this Fourteenth day of April, 1914.

C. J. WONSER
Mayor.

T. M. McCURDY
City Clerk.

BIDDING SHEET

FOR STREET PAVING IMPROVEMENTS AT TAMA, IOWA

Place your Deposit in a separate envelope from your bid. Address each envelope to the City of Tama and endorse each envelope with your name and the name of the improvement.

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The undersigned hereby propose... to furnish all labor and material necessary to construct the improvement in the following named streets according to the plans and specifications on file in the office of the City Clerk at the following unit prices:

THIRD STREET: from the westerly line of Siegel Street to the west line of Harmon Street;
 FOURTH STREET: from Siegel Street to the west line of Harmon Street; SIEGEL STREET: from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and St. Paul Railway; McCLELLAN STREET: from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and St. Paul Railway; STATE STREET: from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and St. Paul Railway; and also the roadways of all intersecting streets and alleys extended from the curb line to the street line produced on each side of said above specified streets between the limits above described:

		UNIT	TOTAL
4,400	cubic yards excavation	:	:
	FORTY CENTS per cu.yd.	.40:	\$1,760.00
800	lineal feet 9-inch tile	:	:
	pipe sewer	:	:
	FORTY CENTS per lin.ft.	.40:	320.00
800	lineal feet 12-inch tile	:	:
	pipe sewer	:	:
	FIFTY CENTS per lin.ft.	.50:	400.00
21	inlets	:	:
	EIGHT DOLLARS (\$8.00) each	8.00:	168.00
4	manholes, complete	:	:
	TWENTY EIGHT DOLLARS	:	:
	(\$28.00) each	28.00:	112.00
13	catch-basins	:	:
	THIRTY FIVE DOLLARS	:	:
	(\$35.00) each	35.00:	455.00
4,800	lineal feet concrete curb	:	:
	(including concrete cross-	:	:
	walk headers and cast-iron	:	:
	cross-walk plates)	:	:
	FORTY CENTS per lin.ft.	.40:	1,920.00
14,500	square yards of vitrified	:	:
	brick paving on 5-in. con-	:	:
	crete and 2-in. sand cushion	:	:
	joints grout filled	:	:
	ONE DOLLAR and EIGHTY NINE	:	:
	CENTS (\$1.89) per sq.yd.	1.89:	27,405.00
Total			\$32,540.00

Purington Paving Blocks to be used.

And should the City Council award the contract to the undersigned, then the undersigned agree... to do such work and furnish such labor and materials upon the terms and conditions prescribed in the foregoing specifications and plans on file with the City Clerk, and in the official advertisement and Resolution ordering the same; and hereby agree... to enter into such contract with the City of Tama within the time and in such manner as will be required by the said City Council for the doing of such, and the furnishing of such labor and materials.

In accordance with the requirements of said specifications, there is deposited herewith cash or a certified check on some responsible bank, payable to the Treasurer of the City of Tama, of the amount of \$3,000.00, the same to be refunded to the undersigned upon the faithful performance of all the conditions of this proposal to the satisfaction of the City Council of the City of Tama.

And it is further agreed that, should the within proposal be accepted by the City Council of the City of Tama, and the undersigned shall fail or neglect to enter into such contract with said City within the time and in the manner as shall be required and approved by said City Council for the work and the furnishing of materials as herein specified, then the sum deposited shall become forfeited to the City of Tama as agreed and liquidated damages.

NOTE: Firms bidding must, in each instance, give the individual name and address of each member of said firm. Where the bid is made by a corporation, it must be signed by its proper officers; also the address of said corporation must be given.

ALL BIDS MUST BE WRITTEN IN INK

Name . THOS. CAREY and SONS . Address
 Name . . By EDW. T. CAREY . . Address
 Sec. and Treas.
 Name Address. CLINTON, IOWA.
 Name Address.

Tama, Iowa . . . April 14, 1914.

Received from the City of Tama the sum deposited with the proposal herewith as noted above, the same being Dollars.

Tama, Iowa 1914.

FORM OF CONTRACT.

THIS CONTRACT, Made and entered into this FIRST day of May, 1914, by and between THOMAS CAREY and SONS, General Contractors, Clinton, Iowa, party of the first part, and the CITY OF TAMA in the County of Tama and State of Iowa, party of the second part, WITNESSETH:

1. That the said party of the first part hereby agrees to furnish at its own expense all necessary materials and labor and to construct the improvement hereinafter designated in a thorough, substantial and workmanlike manner, and in strict compliance with the requirements of this contract and of the plans and specifications hereinafter set out or referred to or hereto attached, to the satisfaction and approval of the Consulting Engineer and the City Council of the City of Tama, TO-WIT: Paving with No. 1 vitrified paving brick on five (5) inches of concrete and two (2) inches sand foundation, cement grout top filler; in THIRD STREET from the westerly line of Siegel Street to the west line of Harmon Street; FOURTH STREET from Siegel Street to the west line of Harmon Street; SIEGEL STREET from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and St. Paul Railway; McCLELLAN STREET from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and St. Paul Railway; STATE STREET from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and St. Paul Railway; and also the roadways of all intersecting streets and alleys extended from the curb line to the street line produced on each side of said above specified streets between the limits described.

2. The said work shall commence on or before the 15th day of May, 1914, and be regularly and diligently prosecuted thereafter, and fully completed on or before the 1st day of September, 1914, unless otherwise provided in writing, signed by the Mayor and approved by the Council of the City of Tama, Iowa.

3. If the said party of the first part shall fail to complete said work by the date specified herein an amount equal to the sum of \$25.00 per day as liquidated damages for breach of this contract, shall be payable to the City of Tama for each day of delay thereafter until final completion of said work and shall be deducted from the amount herein stipulated to be paid to the party of the first part upon final settlement; provided, that the City Council of the City of Tama may waive this provision, or rebate such forfeit, if it so elects.

4. The party of the first part shall comply with all ordinances of the City of Tama relating to the obstructing of streets, keeping open passage ways, protecting the same where exposed and maintaining proper barricades, lights and signals.

5. It is further agreed that the party of the first part shall indemnify and hold the City of Tama harmless from all injury and damages to persons or property and for all expenses of litigation arising from any neglect, default, mismanagement or omission of said party of the first part, his agents or employees, in the performance of any duties imposed by this contract or by law; and if any suit on account thereof shall be commenced against the City of Tama, said party of the first part shall, upon notice thereof, defend the same at its own cost and expense, and the record of any judgment rendered against the City of Tama on account of such act, default or omission of the said party of the first part, his agents or employees, shall be conclusive as against said party of the first part, and entitle the City of Tama to recover the full amount thereof, with interest and costs from the party of the first part, or the sureties on the bond to be given by the said party of the first part for the faithful execution of this contract, and right of action therefor shall accrue to the said City as soon as such judgment shall have been rendered, whether the said City shall have paid the amount thereof or not.

6. The party of the first part further agrees to perform the said work in strict accordance with his contract and with the plans and specifications hereinbefore referred to and made a part of this contract, and with the bidding sheet hereto attached and made a part of this contract. It is understood by the parties to this contract that said City of Tama, Iowa, agrees to pay in the manner and out of the funds hereinafter stated:

The sum of	<u>Forty Cents</u>	per cu. yd.
excavation.		
The sum of	<u>Forty Cents</u>	per lin.ft.
9-inch tile sewer pipe.		
The sum of	<u>Fifty Cents</u>	per lin.ft.
12-inch tile sewer pipe.		
The sum of	<u>Eight Dollars</u>	each,
21 inlets.		
The sum of	<u>Twenty Eight Dollars</u>	each,
4 manholes, complete.		
The sum of	<u>Thirty Five Dollars</u>	each,
13 catch-basins.		
The sum of	<u>Forty Cents</u>	per lin.ft.
of concrete curb.		
The sum of	<u>One & 89/100 Dollars</u>	per sq. yd.
of vitrified brick paving.		

The price of said paving to include all work outside of excess grading necessary for the Contractor to do in order to construct the improvement. Payment to be made thereon and therefor as prescribed by the laws of the State of Iowa, after completion of said work and acceptance thereof by the Engineer and City Council. It is further understood and agreed that the price hereinbefore set forth shall be in full compensation for the cost of the entire work and the City of Tama shall not be liable to said party of the first part for any damage which he may sustain by coming into contact with rock, sand, water or other unforeseen obstacle or material, not set forth in said bidding sheet, or by reason of unfavorable weather. It being the express understanding that the price above stated shall be in full for all work done and the performance of this contract except such additional work as may be ordered as herein provided.

7. It is further agreed that when the street improvement as contracted for has been completed and accepted by the City Council the costs and expense of said street improvement, except such part thereof as shall be payable from the City Improvement Fund, shall be assessed against all lots and parcels of land according to area so as to include one-half of the privately owned property between the street improved and the next street, whether such privately owned property abut upon said street or not, but in no case on privately owned property situated more than three hundred (300) feet from the street improved, and against railways and street railways having tracks thereon, in proportion to the benefits accruing thereto and in accordance with the law governing such assessment including the cost and expense of said improvements at the intersection of streets, avenues and highways, and the City shall issue bonds for such part of said assessment as shall not be paid in cash, and as soon as such bonds shall be negotiated the Contractor shall receive payment on the contract to the amount plus legal interest in which the lots and parcels of land so assessed, was assessed thereon, but no money shall be due under the contract on that portion payable from the assessment against lots and parcels of land so assessed, until the said bonds are issued and negotiated as by law provided, or the City has had reasonable time so to do; said street improvements, the cost of which property owned by the City of Tama, Tama County, Iowa, would be liable and any deficiency where the special assessment which may be levied against any lot or tract of land shall be insufficient to pay the cost of the improvement, shall be paid from the City Improvement Fund by means of a special levy on all property in Tama, Tama County, Iowa, to be made to extend over a period of ten (10) years, said levy to be in accordance with Section 830 of the Code of Iowa, and as by law provided, and when said street improvement as contracted for has been accepted by the City Council said levy will be made and bonds, drawing six (6) per cent interest issued against the same and said bonds to the amount which under the contract, he is entitled to receive from the City Improvement Fund, transferred to the Contractor, or the City may, at its option, negotiate said bonds and make payment to said Contractor out of the proceeds therefrom and the City shall

have a reasonable time so to do.

That the Contractor shall look exclusively to the funds stated in the contract for the payment for said street improvement, and the City of Tama, Tama County, Iowa, will not make itself pecuniarily liable for the payment of the cost of any part of the same and will not incur any indebtedness therefor.

8. It is further agreed by and between the parties hereto that in all cases in which it shall be found that there is a discrepancy or difference between the requirements of this contract proper and the requirements of the plans and specifications hereto attached or herein referred to, the provisions of this contract proper shall govern and shall be and constitute the contract between the parties hereto.

9. It is further agreed that if the prosecution of said work shall be enjoined for any cause, or be delayed by litigation involving the validity of this contract, said work may be completed after said injunction has been dissolved or cause of delay has been removed, the time for the completion of the work hereinbefore specified being extended by the length of such delay so caused.

10. The plans and specifications referred to herein or hereto attached, and all the requirements contained therein, are expressly made a part of this contract; none of the terms or conditions of this contract can be waived, modified or annulled, except in writing endorsed hereon or added hereto, and signed by the Mayor and the Consulting Engineer, and duly approved by the City Council of the City of Tama, Iowa. The party of the first part shall furnish all additional material and labor required by any such changes, and shall be allowed reasonable compensation therefor. If the amount or value of the material and labor required be lessened by such change, an amount equal to said decrease in the cost of material or labor shall be deducted from the amount specified in this contract to be paid said party of the first part, and the said party of the first part shall receive pay only for the amount of work actually done.

11. The party of the first part shall not assign

or transfer his interest in this contract, or any part thereof, or sublet any of the work embraced herein, without the concurrence of the City Council of the City of Tama, in writing, endorsed hereon or added hereto.

12. Said party of the first part further agrees that the improvement herein contracted for shall be thoroughly and substantially constructed, in accordance with the provisions of this contract and the specifications herein referred to, under the penalty set forth in the special bond executed by the party of the first part, of even date herewith and hereto attached, which is expressly made a part of this contract; and to that end, hereby further agrees, undertakes and guarantees that the material and workmanship employed in or upon the work shall be of such character that the improvement shall endure without need of repair during a period of five (5) years from and after the completion thereof; that in case any sign of disintegration appears or any defects occur within said period, except such as are without fault of the Contractor, caused by reason of excavations in the streets, and except such defects as arise from causes not incident to the ordinary use of said improvement, then the Contractor will, within thirty (30) days from the time of being notified of such defect, make the same good, or will pay to the City of Tama the reasonable cost of remedying such defect; it being the intention that the party of the first part hereby guarantees that the improvement herein specified shall be and remain, except as to defects that may appear or repairs which may be needed by reason of excavations or disturbances of the street not caused by said party of the first part, its agents, servants or employees, at the end of five (5) years from the completion thereof in as good condition in all respects as when completed, and as required by this contract and specifications embodied in said contract, and shall be and remain a good, substantial, reliable and durable improvement in material and workmanship, as a whole and in all its parts, except ordinary wear.

This contract shall not be binding upon the City of Tama until the same shall have been duly signed by the Mayor thereof, and attested by the City Clerk, and duly approved by the City Council of said City.

IN WITNESS WHEREOF, The said party of the first part has hereunto set his hand, and the said City of Tama has caused this agreement to be signed by its Mayor, and attested by its City Clerk the day and year first above written.

Approved by
M. W. HYLAND
 City Solicitor.

Approved by
W. W. MARR
 Consulting Engineer.

EDW. T. CAREY
 Sec. & Treas.

CITY OF TAMA, IOWA,
 By

C. J. Wonser,
 Mayor

T. M. McCurdy
 City Clerk.

ATTEST:

--O--O--O--O--O--O--

STATE OF IOWA :
 : SS:
 TAMA COUNTY :

BE IT REMEMBERED, That on the Fourth day of May, A. D. 1914, personally appeared before me C. J. Wonser and T. M. McCurdy, to me personally known to be the MAYOR and CLERK, respectively, of the Incorporated City of TAMA, Tama County, Iowa, and each of them being first duly sworn did say and each for himself says, that he is the MAYOR and CLERK, respectively, of the said Incorporated City of TAMA, Tama County, Iowa, a Municipal Corporation, and that the seal affixed to said instrument is the seal of the said Municipal Corporation and that said instrument was signed and sealed in behalf of said Corporation by authority of the City Council of said Incorporated City of Tama, Tama County, Iowa, and the said C. J. Wonser and T. M. McCurdy, as officers respectively, acknowledge said instrument to be the voluntary act and deed of said Municipal Corporation.

MARK W. HYLAND
 Notary Public in and for
 Tama County, Iowa.

RESOLUTION APPROVING CONTRACT FOR
CONSTRUCTION OF STREET IMPROVEMENTS.

WHEREAS, by resolution duly adopted by this Council at a meeting held on the FOURTEENTH day of April, A. D. 1914, the Mayor and Clerk were authorized and directed to enter into a contract with Thos. Carey & Sons, Clinton, Iowa, for furnishing labor and materials for street improvement on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same,

to conform with the advertisement for bids and the bid of the said Thos. Carey & Sons, Clinton, Iowa, and,

WHEREAS, the said Thos. Carey & Sons, Clinton, Iowa, have entered into a contract with the Incorporated City of Tama, Iowa, by C. J. Wonser, as Mayor, and T. M. McCurdy, as City Clerk, for the construction of the above described street improvements, and such contract is now before this Council with the approval of W. W. Marr of the Aetna Engineering Bureau and M. W. Hyland, City Solicitor, thereon, therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TAMA, IOWA,

That said contract be and the same is hereby approved and ordered filed with the City Clerk,

Passed this FOURTH day of May, A. D. 1914.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

ORDINANCE NO. 109.

AN ORDINANCE ESTABLISHING THE GRADES OF THIRD STREET, FOURTH STREET, SIEGEL STREET, McCLELLAN STREET, AND STATE STREET, IN THE CITY OF TAMA, TAMA COUNTY, IOWA.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF TAMA, IOWA:-

Sec. 1. That the datum plane for the following grades shall be a horizontal plane TEN FEET below the top of a stone now in place at the intersection of the center line of FIFTH AND BEAUTIFUL STREETS, as set out in Section ONE of Ordinance No. 26, of the Revised Ordinances of the City of Tama, Iowa, of the year 1898.

Sec. 11. That a bench mark is hereby established on the cross mark on top of the concrete foundation on the north side of the I. O. O. F. building, at the southwest corner of Fourth and McClellan Streets, THREE feet and THREE inches west of the northeast corner of the building. Elevation above datum 12.48.

Sec. 111. That the following elevations above said datum plane be the established grades of the respective streets at the points named therein, said elevations being the elevations of the center of the streets above datum.

Sec. IV. Line run on Third Street east from the westerly line of Siegel Street to the west line of Harmon Street, elevation above datum at

westerly line of Siegel Street	13.0
center line of Siegel Street	13.0
center line of McClellan Street	11.5
center line of State Street	9.6
east line of State Street	9.3
west line of Harmon Street	7.1

Sec. V. Line run on Fourth Street east from the west line of Siegel Street to the west line of Harmon Street, elevation above datum at

center line of Siegel Street	13.8
center line of McClellan Street	11.5
west line of State Street	10.1

center line of State Street	10.2
east line of State Street	10.35
west line of Harmon Street	8.1

Sec. VI. Line run on Siegel Street from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway, north to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and St. Paul Railway, elevation above datum at

a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago & Northwestern Railway	9.0
southerly line of Third Street	12.8
center line of Third Street	13.0
northerly line of Third Street	13.3
center line produced northwesterly of Fourth Street	13.8
a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee & St. Paul Railway	12.9

Sec. VII. Line run on McClellan Street from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago & Northwestern Railway, north to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee & St. Paul Railway, elevation above datum at

a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago & Northwestern Railway	8.9
the southerly line of Third Street	11.5
the center line of Third Street	11.5
the northerly line of Third Street	11.2
the center line of Fourth Street	11.5
the northerly line of Fourth Street	11.5
a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee & St. Paul Railway	13.9

Sec. VIII. Line run on State Street from a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago and Northwestern Railway, north to a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee and St. Paul Railway, elevation above datum at

a line parallel with and four (4) feet northerly of the center line of the present northerly siding of the Chicago & Northwestern Railway	8.8
at center line produced southeasterly of Third Street	9.6
at southeasterly line produced southeasterly of Fourth Street	10.2
at northerly line produced southeasterly of Fourth Street	10.2
a line parallel with and four (4) feet southerly of the center line of the present southerly siding of the Chicago, Milwaukee & St. Paul Railway	14.0

Sec. X. That all ordinances or parts of ordinances conflicting herewith are hereby repealed.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

Passed May 4, 1914.

Published in Tama News and Tama Herald May 7, 1914.

I, T. M. McCurdy, Clerk of the City of Tama, Tama County, Iowa, certify that the above is a true copy of Ordinance No. 109, as same was passed at a Regular Meeting of the City Council May 4, 1914, and as published in the Tama News and the Tama Herald on the 7th day of May, 1914, both newspapers of general circulation in the City of Tama, Iowa.

T. M. McCURDY

City Clerk,

CERTIFICATE TO AUDITOR FOR LIEN OF TAX.
Code 816.

TO THE COUNTY AUDITOR OF TAMA COUNTY, IOWA:

This certifies that a contract has been made by the Incorporated City of Tama, Iowa, by C. J. Wonsler, as Mayor, and T. M. McCurdy, as City Clerk, with Thos. Carey & Sons, Clinton, Iowa, dated the FIRST day of May A. D. 1914, for the making of the street improvement hereinafter described, and that the following is a copy of the notice of the resolution proposing such street improvement:

(For NOTICE OF INTENTION TO PAVE CERTAIN STREETS, etc., see Page 59.)

This further certifies that the following is a true copy of the proof of publication thereof:

"CERTIFICATE OF PUBLICATION

STATE OF IOWA }
COUNTY OF TAMA } SS:

I, A. E. Jackson, being duly sworn, upon my oath, say that I am the publisher of the 'TAMA NEWS', a weekly newspaper, published in Tama, Tama County, Iowa, and that the printed NOTICE OF INTENTION TO PAVE, hereunto attached, was published in said newspaper on the following dates, TO WIT: FEBRUARY 5, 12, 19, & 26, 1914.

Publication Fee, \$72.50

A. E. JACKSON

Sworn to before me, a Notary Public in and for said County, and subscribed in my presence by A. E. Jackson, this 24th day of March, A. D. 1914.

Witness my hand and Notarial Seal.

(SEAL)

MARK W. HYLAND
Notary Public in and
for Tama County, Iowa."

And this further certifies that the following is a true copy of the proof of publication thereof:

"CERTIFICATE OF PUBLICATION

STATE OF IOWA)
) SS:
COUNTY OF TAMA)

I, C. J. Wonser, being first duly sworn, upon my oath, say that I am PUBLISHER of the TAMA HERALD, a weekly newspaper published in Tama, Tama County, Iowa, and that the printed NOTICE OF INTENTION hereto attached, was published in said newspaper FOUR consecutive weeks, commencing Feb. 5, 1914, and ending Feb. 26, 1914.

C. J. WONSER

Sworn to before me, a Notary Public, in and for said County and subscribed in my presence by C. J. WONSER this 7th day of March, A. D. 1914.

(SEAL)

MARK W. HYLAND
Notary Public in and
for Tama County, Iowa."

This certifies that the City Council of Tama, Iowa, did on the EIGHTEENTH day of March, A. D. 1914, adopt a resolution directing the making of said improvement.

Dated this day of A. D. 1914.

T. M. McCURDY
City Clerk of Tama, Iowa.

C O N T R A C T

(Between Street Railway, City, and Contractor.)

THIS CONTRACT made and entered into this THIRD day of August, A. D. 1914, by and between Thos. Carey & Sons, General Contractors, Clinton, Iowa, party of the first part, and the Tama and Toledo Railway Company, Iowa Railway and Light Company and City of Tama, Tama County, Iowa, parties of the second part, WITNESSETH:

1. That the said party of the first part hereby agrees to furnish at its own expense all necessary material and labor and to construct the improvement hereinafter designated in a thorough, substantial and workmanlike manner, and in strict compliance with the requirements of this contract and of the plans and specifications referred to or hereto attached, to the satisfaction and approval of the Consulting Engineer and the City Council of Tama, Iowa, TO WIT:-

Paving in the following manner:- a layer on concrete five (5) inches in thickness in conformity with the specifications for the paving of the balance of the streets outside the street railway right of way. Upon the concrete foundation shall be spread a layer of sand two (2) inches thick, all as provided in the specifications hereto attached for the paving of the balance of the streets outside the street railway right of way, except that "NOSE" brick shall be adjacent to the inside of each rail and the joints in the pavement shall be filled with paving pitch; such paving to be constructed between the rails and one (1) foot outside thereof of the Tama and Toledo Railway and its successor and assignee, the Iowa Railway and Light Company, upon, over, along and across McClellan Street from the south line of the right of way of the Chicago, Milwaukee and Saint Paul Railway, to Fourth Street, thence westerly upon, over, along and across Fourth Street to Siegel Street; thence southerly upon, along and across Siegel Street to Third Street, and thence westerly along Third Street to the west line of Siegel Street of the City of Tama, Iowa.

2. The said work shall commence on or before the First day of July, A. D. 1914, and be regularly and diligently prosecuted thereafter, and fully completed

on or before the First day of September, A. D. 1914, unless otherwise provided in writing, signed by the Mayor and approved by the City Council of the City of Tama, Tama County, Iowa.

3. If the said party of the first part shall fail to complete said work by the date specified herein an amount equal to the sum of \$25.00 per day in liquidated damages for breach of this contract, shall be payable to the City of Tama, for each day of delay thereafter until final completion of said work and shall be deducted from the amount herein stipulated to be paid to the party of the first part upon final settlement; provided, that the City Council of the City of Tama, may waive this provision, or rebate such forfeiture, if it so elects.

4. The party of the first part shall comply with all ordinances of the City of Tama, relating to the obstructing of streets, keeping open passage ways, protecting the same where exposed and maintaining proper barricades, lights and signals.

5. It is further agreed that the party of the first part shall indemnify and hold the City of Tama, Tama and Toledo Railway Company and Iowa Railway and Light Company, harmless from all injury and damages to persons or property and for all expenses of litigation arising from neglect, default, mismanagement or omission on the part of the said first party, his agents or employees, in the performances of any duties imposed by this contract or by law; and if any suit on account thereof shall be commenced against the City of Tama, said party of the first part, shall, upon notice thereof, defend the same at its own cost and expense, and the record of any judgment rendered against the City of Tama, Tama and Toledo Railway Company or Iowa Railway and Light Company on account of such act, default or omission of the said party of the first part, his agents or employees, shall be conclusive as against said party of the first part, and entitle the City of Tama, Tama and Toledo Railway Company or Iowa Railway and Light Company to recover the full amount thereof, with interest and costs from the party of the first part, or the sureties on the bond to be given by the said party of the first part for the faithful performance of this contract, and the right of action therefor shall

accrue to the said City of Tama, Tama and Toledo Railway Company and Iowa Railway and Light Company as soon as such judgment shall have been rendered, whether the said City of Tama, Tama and Toledo Railway Company and Iowa Railway and Light Company shall have paid the amount or not.

6. The party of the first part further agrees to perform the said work in strict accordance with his contract and with the plans and specifications hereinafter referred to and made a part of this contract. It is understood by the parties to this contract that the said parties of the second part agree to pay in the manner and out of the funds hereinafter stated: Vitrified Brick Block Paving

with pitch filler \$2.50 per sq.yd.

Earth Excavation .40 per cu.yd.

Crushed Stone, delivered along
Company's tracks 2.00 per cu.yd.

Car measurements of stone to govern yardage.

The price of said paving to include all work outside of the excess grading necessary for the Contractor to do in order to construct the improvements. Payment to be made thereon and therefor as prescribed by the laws of the State of Iowa, after completion of said work and acceptance thereof by the Engineer and the City Council. It is further understood and agreed that the price hereinafter set forth shall be in full compensation for the cost of the entire work and the City of Tama shall not be liable to said party of the first part for any damage which he may sustain by coming into contact with water, sand, rock or other unforeseen obstacle or material, not set forth herein, or by reason of unfavorable weather. It being the express understanding that the price above stated shall be in full for all work done and the performance of this contract except such additional work as may be ordered as herein provided.

7. It is further agreed that when the street improvement as contracted for has been completed and accepted by the City Council the costs and expense of said street improvement shall be assessed against the Iowa Railway and Light Company in proportion to the benefit accruing thereto, and in accordance with the law governing such assessment, and the City shall issue bonds for such part of assessment as shall not be paid in cash, and as soon as such bonds shall be

negotiated, the Contractor shall receive payment on the contract to the amount plus legal interest in which the lots and parcels of land, railways and street railways so assessed was assessed thereon, but no money shall be due under the contract until the said bonds are issued and negotiated as by law provided, or the City has had reasonable time so to do.

That the Contractor shall look exclusively to the funds stated in the contract for the payment of said street improvement, and the City of Tama, Tama County, Iowa, will not make itself pecuniarily liable for the payment of the cost of any part of the same and will not incur any indebtedness for the same.

8. It is further agreed by and between the parties hereto that in all cases in which it shall be found that there is a discrepancy or difference between the requirements of this contract proper and the requirements of the plans and specifications hereto attached or herein referred to, the provisions of this contract proper shall govern and shall be and constitute the contract between the parties hereto.

9. It is further agreed that if the prosecution of said work shall be enjoined for any cause, or be delayed by litigation involving the validity of this contract, said work may be completed after said injunction has been dissolved or cause of delay has been removed, the time for the completion of the work hereinbefore specified being extended by the length of such delay so caused.

10. The plans and specifications referred to herein, or hereto attached, and all the requirements contained therein, are expressly made a part of this contract; none of the terms or conditions of this contract can be waived, modified or annulled, except in writing, endorsed hereon or added hereto, and signed by the Mayor and the Consulting Engineer, and duly approved by the City Council of the City of Tama, Iowa. The party of the first part shall furnish all additional material and labor required by any such changes and shall be allowed reasonable compensation therefor. If the amount or value of the material and labor required be lessened by such change, an amount equal to said decrease in the cost of the material or labor shall be deducted from the amount specified in this contract to be paid said party of the first part, and said party of the first part

shall receive pay only for the amount of work actually done.

11. The party of the first part shall not assign or transfer his interest in this contract, or any part thereof, or sublet any of the work embraced herein, without the concurrence of the City Council of the City of Tama, in writing, endorsed hereon or added hereto.

12. Said party of the first part further agrees that the improvement herein contracted for shall be thoroughly and substantially constructed, in accordance with the provisions of this contract and the specifications herein referred to, under the penalty set forth in the certain bond executed by the party of the first part, of even date herewith and hereto attached, which is expressly made a part of this contract; and to this end, hereby further agrees, undertakes and guarantees that the material and workmanship employed in or upon the work shall be of such character that the improvement shall endure without need of repair during a period of five (5) years from and after the completion thereof; that in case any sign of disintegration appears or any defects occur within said period, except such as are without fault of the Contractor, caused by reason of excavation in the streets, and except such defects as arise from causes not incident to the ordinary use of said improvements, then the Contractor will, within thirty (30) days from the time of being notified of such defect, make the same good, or will pay to the City of Tama the reasonable cost of remedying such defect; it being the intention that the party of the first part hereby guarantees that the improvement herein specified shall be and remain, except as to defects that may appear or repairs which may be needed by reason of excavations or disturbances of the streets not caused by said party of the first part, its agents, servants or employes, at the end of five (5) years, from the completion thereof in as good condition in all respects as when completed and as required by this contract and specifications embodied in said contract, and shall be and remain a good, substantial, reliable and durable improvement in material and workmanship, as a whole and in all its parts, except ordinary wear.

This contract shall not be binding upon the City

of Tama until the same shall have been duly signed by the Mayor thereof, and attested by the City Clerk, and duly approved by the City Council of said City.

13. IT IS UNDERSTOOD AND AGREED that the Iowa Railway and Light Company accepts and approves the plans and specifications as adopted by the said City of Tama for the construction of the paving between the rails and on one (1) foot on either side thereof of its said street or interurban railway tracks from the south line of the right of way of the Chicago, Milwaukee and St. Paul Railway Company right of way where it intersects with McClellan Street, upon, over, along and across McClellan Street to Fourth Street, thence westerly along, over and across Fourth Street to Siegel Street, thence southerly along, over and across Siegel Street to Third Street, thence westerly upon, along, over and across Third Street to the west line of Siegel Street; and waives any and all irregularities in the proceedings and adoption of the Resolution of Necessity, the resolution ordering in paving and the notices published for the hearing thereof, and consents that the City may build, construct or cause to be built or constructed the paving on the above described portion of said streets so ordered paved where said Railway Company occupies the same with its street or interurban railway tracks, in accord with the plans and specifications adopted at a meeting of the City Council of said City held on the First day of June, 1914, a copy of which plans and specifications are hereto attached, marked Exhibit "A" and made a part hereof, expressly reserving, however, to the said Tama and Toledo Railway of the Iowa Railway and Light Company, as its assignees, the statutory right as to future irregularities of proceedings, etc., and the right to consent to the assessment and to pay said assessments in installments as provided by Sections 823 of the Code as amended by Chapter 42 of the Acts of the 34th General Assembly of Iowa and 824 of the Code and Section 825 of the Code as amended by Chapter 82 of the Acts of the 35th General Assembly of Iowa, and Sections 826, 827, 828 and 829 of the Code of Iowa.

14. That the second parties, the Tama and Toledo Railway Company and the Iowa Railway and Light Company consent to the certification in the regular

manner of the amount due by them under this contract, said assessment to have the usual legal effect of assessments under the laws of the State of Iowa, preserving to the Tama and Toledo Railway Company and the Iowa Railway and Light Company the right to pay for the work and labor herein designated in seven (7) equal installments as by law provided for paying of paving assessment and further reserving to Tama and Toledo Railway Company and the Iowa Railway and Light Company the right to object, as any other property owner assessed, to the faulty construction or workmanship of the improvement herein designated; but notwithstanding said objections, said Tama and Toledo Railway Company and Iowa Railway and Light Company shall possess and retain the right to pay for said pavement and the amount found due therefor in seven (7) annual equal installments.

IN WITNESS WHEREOF, the party of the first part has hereunto set his hand, and the said City of Tama has caused this agreement to be signed by its Mayor, and attested by its City Clerk, and the Tama and Toledo Railway Company and Iowa Railway and Light Company by their respective officers and their corporate seals thereto attached.

THOS. CAREY & SONS

Approved by	By Jno. F. Carey,
	President.
Mark W. Hyland	By Edw. T. Carey,
City Attorney.	Sec. & Treas.

CITY OF TAMA, TAMA COUNTY, IOWA.

Approved by	By C. J. Wonser,
	Mayor.
W. W. Marr	By T. M. McCurdy,
Engineer.	City Clerk.

TAMA AND TOLEDO RAILWAY COMPANY

Approved as to form	By Jno. A. Reed,
	President.
John A. Reed	By R. S. Clark,
Gen. Atty.	Sec'y.

IOWA RAILWAY AND LIGHT COMPANY

	By Jno. A. Reed,
	President.
	By C. S. Woodward,
	Sec'y.

STATE OF IOWA :
 : SS:
 CLINTON COUNTY :

On this Second day of August, A. D. 1914, before me appeared Thos. Carey and Edward T. Carey, to me personally known, and who being by me duly sworn, each for himself did say he is the President and Secretary, respectively, of Thos. Carey & Sons (incorporated), and that said instrument was signed and sealed in behalf of said Corporation by authority of its Board of Directors, and said Thos. Carey and Edward T. Carey acknowledge said instrument to be the voluntary act and deed of said Corporation.

Notary Public in and for
 Clinton County.

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STATE OF IOWA :
 : SS:
 TAMA COUNTY :

BE IT REMEMBERED, that on this Third day of August, A. D. 1914, personally appeared before me C. J. WONSER and T. M. McCURDY, to me personally known to be the Mayor and Clerk, respectively, of the City of Tama, State of Iowa, and each of them being first duly sworn did say and each for himself says, that he is the Mayor and Clerk, respectively, of the City of Tama, a Municipal Corporation, and that the seal affixed to said instrument is the seal of said Municipal Corporation and that said instrument was signed and sealed in behalf of said Corporation by authority of the City Council of said City of Tama and said C. J. WONSER and T. M. McCURDY as such officers, respectively, acknowledge said instrument to be the voluntary act and deed of said Municipal Corporation.

MARK W. HYLAND

Notary Public in and for
 Tama County.

STATE OF IOWA :
 : SS:
 LINN COUNTY :

On this Third day of August, A. D. 1914, before me appeared Jno. A. Reed and R. S. Clark, to me personally known and being by me duly sworn each for himself did say that he is the President and Secretary of the Tama and Toledo Railway Company, and that said instrument was signed and sealed in behalf of said Corporation by authority of its Board of Directors, and said Jno. A. Reed and R. S. Clark acknowledge said instrument to be the voluntary act and deed of said Corporation.

T. M. CATHAWAY

Notary Public in and for
 Linn County, Iowa.

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STATE OF IOWA :
 : SS:
 LINN COUNTY :

On this Third day of August, A. D. 1914, before me appeared Jno. A. Reed and C. S. Woodward, to me personally known and who by me being duly sworn, each for himself did say that he is Vice-President and Secretary of the Iowa Railway and Light Company and that the seal affixed to the said above instrument is the corporate seal of said Corporation and that said instrument was signed and sealed in behalf of said Corporation by authority of its Board of Directors, and said Jno. A. Reed and C. S. Woodward acknowledge said instrument to be the voluntary act and deed of said Corporation.

Notary Public in and for
 Linn County, Iowa.

SPECIFICATIONS FOR PAVING THE RIGHT OF WAY
OF THE STREET RAILWAY COMPANY, TAMA, IOWA.

The road shall be brought to the proper sub-grade by cutting or filling and thoroughly compacted and secured from further settlement by flooding, ramming or rolling or all (as may be deemed necessary by the Engineer).

On the sub-grade as above prepared shall be laid a layer of the best quality of broken limestone crushed to a size that will pass through a ring of two (2) inches internal diameter but be retained upon a ring of one-half ($1/2$) inch internal diameter. The stone shall be rolled with a ten (10) ton roller until thoroughly compacted to a uniform thickness of six (6) inches.

After the ties have been placed and the steel rails fastened thereto and brought to the proper line and grade by tamping up the ties with limestone screenings (or other suitable material) sufficient additional limestone screenings (or other suitable material) shall be spread to bring the exposed surface of the roadbed to a grade eleven (11) inches below and parallel with the surface of the finished pavement.

Upon the exposed surface of the roadbed thus prepared shall be spread a layer of concrete five (5) inches in thickness in conformity with the specifications for the paving of the balance of the streets outside the street railway right of way. Upon the concrete foundation shall be spread a layer of sand two (2) inches in thickness and a brick wearing surface four (4) inches in thickness, all as provided in the specifications hereto attached for the paving of the balance of the streets outside the street railway right of way, except that "NOSE" brick shall be adjacent to the inside of each rail and the joints shall be filled with paving pitch which is the direct result of the distillation of coal tar instead of Portland cement grout. The coal tar shall have a melting point not to exceed 145° Fahr. and not less than 140° Fahr.

PERMISSION WILL PROBABLY BE GRANTED FOR THE USE OF "ELASTITS" FOR EXPANSION JOINTS.

RESOLUTION APPROVING CONTRACT FOR PAVING
STREET RAILWAY RIGHT-OF-WAY.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY
OF TAMA, IOWA:

That the contract between Thos. Carey & Sons,
and the Iowa Railway and Light Company, the Tama
and Toledo Railway Company and the City of Tama,
Tama County, Iowa, for paving the right-of-way of
said street railways on McClellan, Fourth, Siegel
and Third Streets, be and the same is hereby approv-
ed and ordered filed.

Passed this Third day of August, 1914.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

NORTHWESTERN STATES PORTLAND CEMENT CO.

TEST SHEET

Mason City, Iowa, July 1, 1914.

Order No. 5259150 Barrels in Car No. 53011 Initials D.S.L.Shipped to Wm. Stewart Lumber Co.Tama, Iowa.

IF TESTED by competent persons under methods mentioned below, the Cement contained in this shipment is guaranteed to give the following results:

Initial Set 3--05 Hrs.Fineness 95.3 per cent through 100 mesh sieveFineness 76.4 per cent through 200 mesh sieve

: Pat in water at atmospheric temp.

Constancy : 28 days - - - - -

of Volume :

: Pat in steam 6 hours - - - - - O.K.

TENSILE STRENGTH IN POUNDS PER SQUARE INCH

	1 day	7 days	28 days
Neat Cement	<u>310</u>	<u>615</u>	<u>720</u>
1 part Cement, 3 parts Sand - - -	<u>270</u>	<u>360</u>	

NORTHWESTERN STATES PORTLAND CEMENT COMPANY.

Per GEO. P. DECKMANN Chief Chemist.
Member American Society of Testing Materials.

NOTE:-- Tests are conducted according to the standard methods recommended by the American Society for Testing Materials.

ROBERT W. HUNT and CO. ENGINEERS.

General Offices, 2200 INSURANCE EXCHANGE, Chicago.
Telephone WABASH 872

Chicago, June 2nd, 1914.

Aetna Engineering Bureau
17 N. La Salle Street,
Chicago, Illinois.

Gentlemen:

The following is a report of our Rattler Tests on certain paving brick received from Tama, Iowa. The tests were made on the Standard Rattler of the National Brick Makers Association adopted in 1911.

RATTLER TESTS

Brand -- Purington Pavers.

Marks -- None

Dimensions -- 8.52" x 4.01" x 3.39"

	<u>Test No.1</u>	<u>Test No.2</u>
Wgt of abrasive material -- small shot	225#	225#
Wgt of abrasive material -- large shot	75#	75#
Number of revolutions for test	1800	1800
Number of Brick for test	10	10
Av. number of revolutions per minute	30.5	30.5
Wgt. of brick before test	93.75#	96.35#
" " " after test	74.20#	77.37#
Loss of wgt. due to abrasion	19.55#	18.98#
% loss in wgt.	20.85%	19.70%
Number of brick broken	One	One

Respectfully submitted,

HHM/P

Robert W. Hunt & Co.

ENGINEER'S CERTIFICATE OF THE COMPLETION
OF THE WORK.

TO THE MAYOR AND CITY COUNCIL OF THE CITY OF TAMA,
IOWA:

Gentlemen:

I herewith certify that the street improvement on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same,

constructed under a contract with Thos. Carey & Sons of Clinton, Iowa, dated the FIRST day of May, A. D. 1914, has been completed according to the terms and stipulations of the contract.

AETNA ENGINEERING BUREAU

By _____

Provided for by Code 846. This certificate must be filed before the adoption of any resolution for the delivery of any bonds or certificates issued for street improvement or for the payment of any of the proceeds therefrom.

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RESOLUTION ACCEPTING STREET IMPROVEMENT
AND ORDERING PLAT AND SCHEDULE FILED.

Provided for by Code 821.

WHEREAS, Thos. Carey and Sons, of Clinton, Iowa, have under contract with the City of Tama, Iowa, dated the FIRST day of May, A. D. 1914, completed according to the terms and stipulations of the contract the street improvements heretofore ordered on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same, THEREFORE:

BE IT RESOLVED BY THE CITY COUNCIL OF TAMA, TAMA COUNTY, IOWA:

That said street improvement be and the same is hereby approved and accepted.

BE IT FURTHER RESOLVED,

That the AETNA ENGINEERING BUREAU, Consulting Engineers, be and is hereby directed to prepare and file in the office of the City Clerk for public inspection a plat and schedule of the above named streets and parts of streets showing the separate lots or parcels of ground, or specified portions thereof, subject to assessment for such street improvement, the names of the owners thereof as far as practicable, and the amount to be assessed against each lot or parcel of ground, and against any railway or street railway; and said plat and schedule shall also show the amount chargeable to the City Improvement Fund for such street improvement.

Passed this 28th day of August, A. D. 1914.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

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RESOLUTION MAKING LEVY FOR STREET IMPROVEMENT FUND.

Provided for by Code Sections 817 and 830.

WHEREAS, on the 18th day of March, A. D. 1914, the City Council of Tama, Tama County, Iowa, ordered the improvement of the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same, and on the said day ordered that the cost and expense of said street improvement where the City of Tama, Tama County, Iowa, would be liable and any deficiency where the special assessment which may be levied against any lot or tract of land shall be

insufficient to pay the cost of the improvement, shall be paid from the City Improvement Fund, and

WHEREAS, the City of Tama, Tama County, Iowa, on the FIRST day of May, A. D. 1914, entered into a contract with Thos. Carey and Sons for the construction of said street improvement and under said contract the work has been completed and was on the 28th day of August, 1914, approved and accepted by the City Council, and,

WHEREAS, there is now on file for public inspection in the office of the City Clerk a plat and schedule marked "PLAT A" of the above named streets and parts of streets showing the amount chargeable to the City Improvement Fund for such street improvement to be (\$.....) Dollars, therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TAMA, TAMA COUNTY, IOWA:

That said plat and schedule is hereby accepted and approved and that there is hereby levied for the City Improvement Fund of Tama, Tama County, Iowa, a special tax of mills on the dollar upon all property within the City of Tama, Tama County, Iowa, which said levy shall be made to extend over a period of ten (10) years and be payable mills each year, to pay the amount charged against such fund for street improvement and to pay the principal and interest on any bonds hereafter issued by the City of Tama, Tama County, Iowa, for the purpose of paying said charge and against this levy.

BE IT FURTHER RESOLVED:

That the City Clerk be and he is hereby directed to file with the County Auditor of Tama County, Iowa, a certificate of the levy herein provided for, setting forth the amount or percentage and maturity of said tax, or each installment thereof, upon the assessed valuation of all property in Tama, Tama County, Iowa, and certify to the same as correct.

Passed this day of 1914.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

CERTIFICATE TO AUDITOR OF SPECIAL LEVY.
 Provided for by Code Section 830.

TO THE AUDITOR OF TAMA COUNTY, IOWA:

This certifies that the City Council of Tama, Iowa, on the 28th day of August, A. D. 1914, levied a special tax of mills upon the assessed valuation of all property in Tama, Tama County, Iowa, which levy shall be made to extend over a period of ten (10) years and shall be payable mills each year, to be paid into the City Improvement Fund to pay the amount charged to said fund for street improvement on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same.

Ordered by the City Council on the Eighteenth day of March, A. D. 1914, which said street improvement has been completed and was on the 28th day of August, A. D. 1914, approved and accepted by the City Council, and I hereby certify the foregoing is correct.

Dated this day of, A. D. 1914.

T. M. McCURDY

City Clerk.

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RESOLUTION AUTHORIZING ISSUING OF
 CITY IMPROVEMENT BONDS.

Provided for by Code Chapter 12, Title 5, and particularly Section 912.

WHEREAS, on the Eighteenth day of March, A. D. 1914, the City Council of Tama, Tama County, Iowa, ordered the improvement of the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same, and

shall mature	April 1, 19..
" "	" 1, 19..
" "	" 1, 19..
" "	" 1, 19..

Said bonds shall be issued by not less than One Hundred Dollars (\$100.00), nor more than One Thousand Dollars (\$1,000.00), and shall bear interest at the rate of six (6) per cent per annum, payable annually, principal and interest, at the office of the City Treasurer of Tama, Tama County, Iowa.

When said bonds have been executed as aforesaid, they shall be delivered to the Treasurer, and his receipt taken therefor, and the Treasurer shall register the same, as by law provided, and shall sell the bonds for cash on the best available terms and place the proceeds in the City Improvement Fund; and in such case, the Mayor and Clerk shall draw a warrant on said fund in favor of Thos. Carey & Sons for Dollars (\$.....). If said bonds are not sold within five (5) days after delivery to the Treasurer, he shall exchange the same on like terms with Thos. Carey & Sons in exchange for the indebtedness of the City with the said Thos. Carey & Sons for that portion of said street improvement payable from this fund amounting toDollars (\$.....), and the balance received by the Treasurer over and above such indebtedness shall be placed in the City Improvement Fund. In no case shall the bonds be sold or exchanged for a less sum than their face value and all interest at the date of sale or exchange.

Passed this day of, A. D. 1914.

C. J. WONSER

Mayor

T. M. McCURDY

City Clerk.

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RESOLUTION DIRECTING CITY CLERK TO GIVE
NOTICE OF ASSESSMENT.

Provided for by Code Supp. 823.

WHEREAS, the street improvement heretofore ordered on the following streets and parts of streets,

TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits full described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same,

and constructed under a contract with Thos. Carey & Sons, dated the First day of May, A. D. 1914, has been completed and was on the 28th day of August, A. D. 1914, approved and accepted by the City Council, and,

WHEREAS, there is now on file for public inspection in the office of the City Clerk a plat and schedule marked "PLAT A" of the above named streets and parts of streets showing the separate lots or parcels of ground, or specified portions thereof, subject to assessment for such street improvement, the names of the owners thereof, as far as practicable, and the amount to be assessed against each lot or parcel of ground and against any railway or street railway which said plat and schedule was on the 28th day of August, A. D. 1914, accepted and approved by the City Council, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF TAMA, TAMA COUNTY, IOWA:

That the City Clerk be and he is hereby directed to give notice by two (2) publications in each of two (2) newspapers published in the City and by handbills posted in conspicuous places along the line of such street improvement that such plat and schedule is on file in the office of the Clerk, and that within twenty (20) days after the first publication all objections thereto, or to the prior proceedings, on account of errors, irregularities or inequalities, must be made in writing and filed with the Clerk; and the City Council after the expiration of said twenty (20) days at the first regular meeting held thereafter, or at a special meeting called for that purpose, having heard such objections and made the necessary corrections, will then make the special assessments as shown in said plat and schedule as corrected and approved.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

NOTICE OF FILING OF PLAT AND SCHEDULE
Provided for by Code Supp. 823.

Notice is hereby given that there is now on file for public inspection in the office of the City Clerk a plat and schedule marked "PLAT A" of the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 58), all in Tama, Tama County, Iowa, by grading, curbing and paving the same,

whereon said street improvement constructed under a contract with Thos. Carey & Sons dated the First day of May, A. D. 1914, has been completed.

Said plat and schedule shows the separate lots or parcels of ground, or specified portions thereof, subject to assessment for such street improvement, the names of the owners as far as practicable, and the amount to be assessed against each lot or parcel of ground, and against any railway or street railway.

Notice is further given that within twenty (20) days after the first publication of this notice all objections to said plat and schedule, or to the prior proceedings, on account of errors, irregularities or inequalities, must be made in writing and filed with the City Clerk; and the City Council after the expiration of said twenty (20) days at the first regular meeting held thereafter, or at a special meeting called for that purpose, having heard such objections and made the necessary corrections, will then make the special assessment as shown in said plat and schedule as corrected and approved.

Dated this 28th day of August, A. D. 1914.

T. M. McCURDY
City Clerk of Tama,
Tama County, Iowa.

CERTIFICATE OF POSTING NOTICE.

I, J. W. Shively, Marshal of Tama, Tama County, Iowa, hereby certify that on the day of I posted handbills bearing the above notice in conspicuous places along the line of street improvement described therein.

J. W. SHIVELY

Marshal of Tama, Tama
County, Iowa.

Dated the day of , 1914.

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WAIVER.

WHEREAS, the street improvement heretofore ordered on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 58), all in Tama, Tama County, Iowa,

and constructed under a contract with Thos. Carey & Sons, dated the First day of May, A. D. 1914, has been completed and was on the 28th day of August, A. D. 1914, approved and accepted by the City Council, and,

WHEREAS, there is now on file for public inspection in the office of the City Clerk, a plat and schedule marked "Plat A" of the above named streets and parts of streets, showing the separate lots or parcels of ground, or specified portion thereof, subject to assessment for such street improvement, the names of the owners thereof, as far as practicable, and the amount to be assessed against each lot or parcel of ground and against any railway or street railway, which said plat and schedule was on the Tenth day of November, A. D. 1914, approved and accepted by the City Council, and,

WHEREAS, the City Council of Tama, Tama County, Iowa, by resolution duly adopted, assessed and

levied a special tax for such street improvement against each of the said lots or parcels of ground, as shown by said plat and schedule and as more particularly described in said resolution, and set forth the amount so assessed and levied against each lot or parcel of ground so described,

THEREFORE, the undersigned being the owner or owners of certain of said lots or parcels of ground as described in said plat and said resolutions, in consideration of having the right to pay such assessment in installments as by statute provided in such cases, do hereby severally promise and agree that he or they will not make any objection of inequality, illegality, or irregularity as to the assessment of such tax on his or their property, and will pay said assessment with interest thereon as provided by said resolution, being six (6) per cent, per annum, from the date of the acceptance of such work by the City Council and in the manner provided by law.

Signed this day of A.D. 1914

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EXPLANATION FOR PAVING TAX AND NOTICE OF ASSESSMENT.

To

If the foregoing waiver is not signed, then the whole of the tax is due and payable on the date of such assessment and will be collected at the next succeeding March semi-annual payment of ordinary taxes.

If such waiver is signed, then the tax is payable in seven (7) equal installments, the first of

which becomes due on the date of such assessment, and the other six (6) installments are payable annually thereafter, in one, two, three, four, five and six years, respectively, from the date of such assessment, and such tax or installment falling due, if not sooner paid, will be collected at the same time with the next March semi-annual payment of ordinary taxes after the same falls due and such tax bears interest at six (6) per cent, per annum, from the date of acceptance of the work by the City Council and the interest on the whole assessment is payable and collectable at the time of the collection of each installment or at the time of the collection of said tax where no waiver is signed.

A certified copy of the resolution referred to in the foregoing waiver is on file in the office of T. L. Williamson, City Treasurer of Tama, Tama County, Iowa, and such of said property owners as sign such waiver will call at the office of said City Treasurer within thirty (30) days from the date of such assessment and pay one-seventh of their respective assessments with interest as aforesaid, and those who do not sign such waiver will, within thirty (30) days, call at the office of the City Treasurer and pay their entire assessment with interest, if any accrued. All such assessments or parts thereof, not so paid will, at the end of said thirty (30) days, be certified by the City Clerk of Tama, Tama County, Iowa, to the County Auditor of Tama County, Iowa, to be placed on the tax books of said County and collected as by law provided.

All other information desired by property owners will be given at the office of the City Clerk or the City Solicitor.

You will take notice that there has been assessed against the following described property, situated in Tama, Tama County, Iowa, TO-WIT:

.....

T. M. McCURDY,

City Clerk of Tama, Iowa.

(Mailed to every one against whom an assessment was levied on August 29th, 1914.)

RESOLUTION OVERRULING OBJECTIONS.
Provided for by Code 823.

WHEREAS, due notice, as by law required, has been given that a plat and schedule marked "Plat A", of the following streets and parts of streets, TO-WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 58), all in Tama, Tama County, Iowa,

showing the separate lots or parcels of ground, or specified portions thereof, subject to assessment for street improvement thereon, constructed under contract with Thos. Carey & Sons, dated the First day of May, 1914, the names of the owners thereof, as far as practicable, and the amount to be assessed against each lot or parcel of ground and against any railway or street railway was on file in the office of the City Clerk, and that within twenty (20) days after the first publication all objections thereto, or to the prior proceedings, on account of errors, irregularities, or inequalities, must be made in writing and filed with the City Clerk, and that the City Council after the expiration of said twenty (20) days at the first regular meeting held thereafter, or at a special meeting called for that purpose, having heard such objections, should then make the special assessment as shown in said plat and schedule as corrected and approved, and,

WHEREAS, said twenty (20) days have elapsed and the City Council having met at a regular meeting this Tenth day of November, A. D. 1914, and having heard and considered all objections pertaining to said street improvement, therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF TAMA, TAMA COUNTY, IOWA:

That all objections be and the same are hereby overruled and said plat and schedule is hereby approved.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

RESOLUTION DIRECTING PAYMENT TO CONTRACTOR.

WHEREAS, the City Council on the Tenth day of November, A. D. 1914, assessed and levied a special tax for street improvement heretofore constructed by Thos. Carey & Sons, therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF TAMA, IOWA:

That the Mayor and City Clerk be and they are hereby authorized and directed to draw warrants, not to exceed in amount the balance due and payable to the Contractor from such levy in favor of the said Thos. Carey & Sons, on the fund created for the reception of the levy, whenever there shall be an amount equal to Five Hundred Dollars (\$500.00) in such fund.

Passed this day of A. D. 1914.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

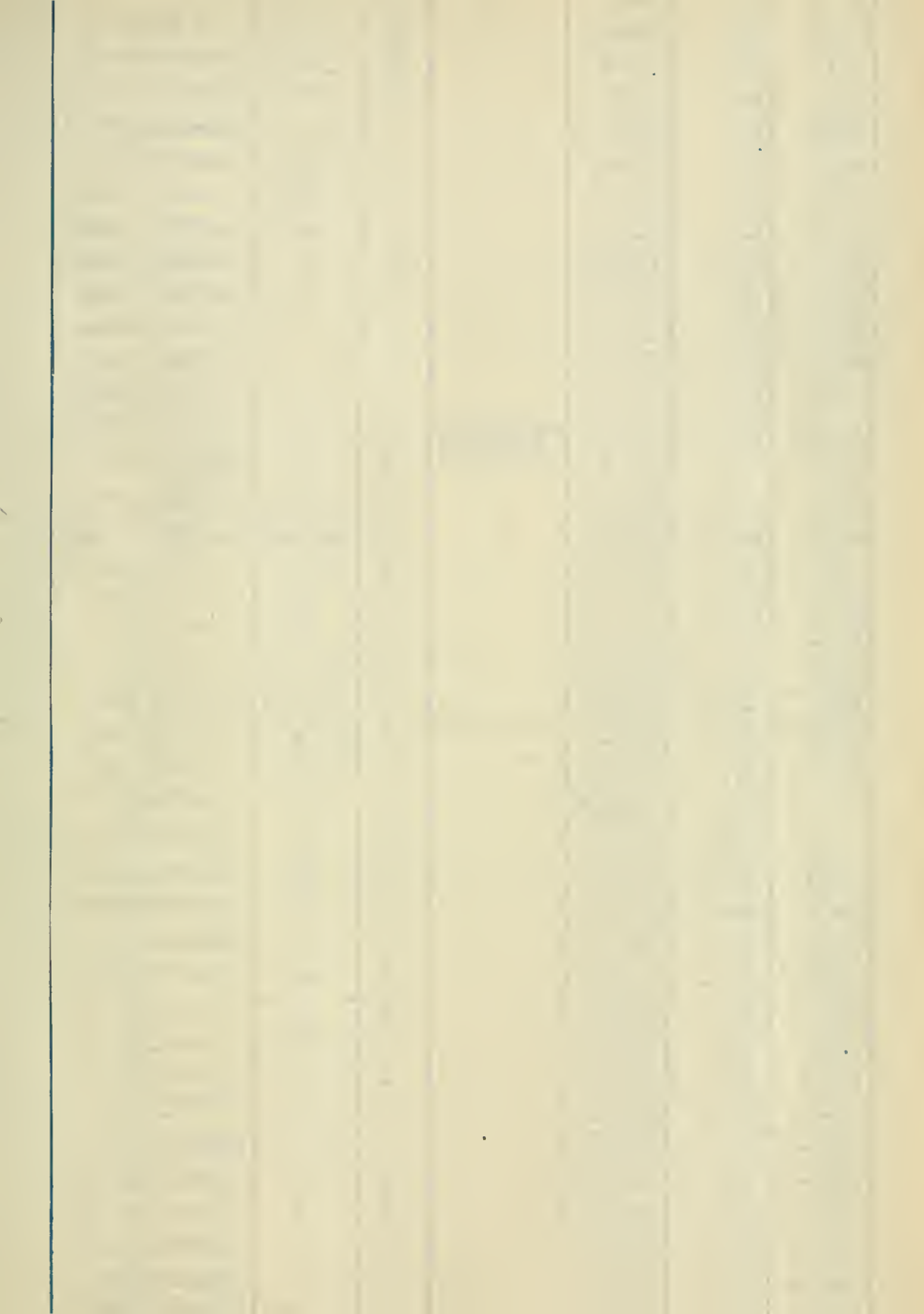
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CERTIFICATE TO THE COUNTY AUDITOR
OF SPECIAL ASSESSMENT.

TO THE COUNTY AUDITOR OF TAMA COUNTY, IOWA:

This certifies that on the First day of May, A. D. 1914, the City of Tama, Tama County, Iowa, entered into a contract with THOS. CAREY AND SONS, of Clinton, Iowa, for the construction of street improvement on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, by grading, curbing and paving the same.

That on the 28th day of August, A. D. 1914, said work had been completed and was approved and accepted by the City Council of said City, and on the 28th day of August, A. D. 1914, a plat and schedule marked "Plat 'A'", showing the separate lots or parcels



OWNER'S NAME	LOT	BLK	SUBDIVISION	TOTAL ASSESSMENT	AMOUNT PAID	Balance Due
AC MURDOUGH	1	2		500.00	71.43	428.57
AC MURDOUGH	W 1/2-2	2		212.50	30.36	182.14
JOHN H. MURDOUGH	3	2		470.50	67.22	403.28
JOHN H. MURDOUGH	4	2		470.50	67.21	403.29
JOHN H. MURDOUGH	E 1/2-5	2		235.25	33.61	201.64
JOHN H. MURDOUGH	W 1/2-6	2		235.25	33.6	201.64
JOHN H. MURDOUGH	E 1/2-6	2		235.25	33.61	201.64
JOHN H. MURDOUGH	7	2		606.77	95.25	511.52
JOHN H. MURDOUGH	E 1/2-2	1		239.60	34.23	205.37
JOHN H. MURDOUGH	W 1/2-3	1		239.60	34.23	205.37
JOHN H. MURDOUGH	E 1/2-4	1		237.18	33.89	203.29
JOHN H. MURDOUGH	E 1/2-5	1		237.18	33.89	203.29
JOHN H. MURDOUGH	6	1		92.75	13.65	79.10
JOHN H. MURDOUGH	E 1/4-6	10		101.43	14.50	86.93
JOHN H. MURDOUGH	W 1/2-5	10		210.80	30.1	180.69
JOHN H. MURDOUGH	W 3/4-3	10		234.62	33.43	201.19
JOHN H. MURDOUGH	17	11		167.78	23.97	143.81
JOHN H. MURDOUGH	16	11		186.24	26.60	159.64
JOHN H. MURDOUGH	14	11		265.00	37.86	227.14
JOHN H. MURDOUGH	E 2-3	11		21.00	3.00	18.00
JOHN H. MURDOUGH	11	11		446.30	63.77	382.53
JOHN H. MURDOUGH	11	11		233.09	33.30	199.79
JOHN H. MURDOUGH	E 1/2-10	6		176.10	25.15	150.95
JOHN H. MURDOUGH	8	6		54.51	7.9	46.61
JOHN H. MURDOUGH	E 2/4-5-7	6		235.58	33.65	201.93
JOHN H. MURDOUGH	E 2/4-5-6	6		195.70	27.96	167.74
JOHN H. MURDOUGH	W 1/2-5	6		202.45	28.92	173.53
JOHN H. MURDOUGH	W 1/2-5	6		40.5	5.73	34.77
JOHN H. MURDOUGH	E 2/5-5	6		208.64	29.80	178.84
JOHN H. MURDOUGH	W 3/4-5	6		37.48	5.35	32.13
JOHN H. MURDOUGH	E 2/4-4	6		205.12	19.3	185.8
JOHN H. MURDOUGH	W 1/2-3	6		13.43	1.92	11.51
JOHN H. MURDOUGH	E 2/4-2	6		220.17	32.74	187.43
JOHN H. MURDOUGH	W 1/2-4	5		235.25	33.61	201.64
JOHN H. MURDOUGH	3	5		45.99	6.57	39.42
JOHN H. MURDOUGH	2	5		229.95	32.85	197.10
JOHN H. MURDOUGH	1	5		229.95	32.85	197.10
JOHN H. MURDOUGH	1	5		399.67	57.10	342.57
JOHN H. MURDOUGH	1	4		203.67	29.10	174.57
JOHN H. MURDOUGH	16	4		101.83	14.55	87.28
JOHN H. MURDOUGH	15	4		20.00	2.86	17.14
JOHN H. MURDOUGH	28	5		33.27	4.735	28.535
JOHN H. MURDOUGH	27	5		16.55	2.308	14.242
JOHN H. MURDOUGH	26	5		16.55	2.308	14.242
JOHN H. MURDOUGH	25	5		16.55	2.308	14.242
JOHN H. MURDOUGH	24	5		25.00	3.785	21.215
JOHN H. MURDOUGH	23	5		125.00	17.86	107.14
JOHN H. MURDOUGH	22	5		42.50	6.08	36.42
JOHN H. MURDOUGH	W 8-8-20	5		42.50	6.08	36.42
JOHN H. MURDOUGH	16	5		60.85	8.72	52.13
JOHN H. MURDOUGH	17	5		60.85	8.72	52.13
JOHN H. MURDOUGH	16	5		60.85	8.72	52.13
JOHN H. MURDOUGH	15	5		60.85	8.72	52.13
JOHN H. MURDOUGH	14	5		60.85	8.72	52.13
JOHN H. MURDOUGH	13	5		60.85	8.72	52.13
JOHN H. MURDOUGH	12	5		60.85	8.72	52.13
JOHN H. MURDOUGH	11	5		60.85	8.72	52.13
JOHN H. MURDOUGH	10	5		60.85	8.72	52.13
JOHN H. MURDOUGH	9	5		60.85	8.72	52.13
JOHN H. MURDOUGH	8	5		60.85	8.72	52.13
JOHN H. MURDOUGH	7	5		60.85	8.72	52.13
JOHN H. MURDOUGH	6	5		60.85	8.72	52.13
JOHN H. MURDOUGH	5	5		60.85	8.72	52.13
JOHN H. MURDOUGH	4	5		60.85	8.72	52.13
JOHN H. MURDOUGH	3	5		60.85	8.72	52.13
JOHN H. MURDOUGH	2	5		60.85	8.72	52.13
JOHN H. MURDOUGH	1	5		60.85	8.72	52.13
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JOHN H. MURDOUGH	1	5		60.85	8.72	52.13
JOHN H. MURDOUGH</						

of ground subject to assessment for such street improvement, the names of the owners, as far as practicable, and the amount to be assessed against each lot or parcel of ground, was on file for public inspection in the office of the City Clerk and was approved and accepted by the City Council.

That on the 10th day of November, A. D. 1914, there was duly adopted by said City Council a resolution by which it was ordered that the several assessments against the property as specified in said plat and schedule and proposed thereby be and the same was thereby confirmed.

It was then by said resolution ordered that there be and there was thereby assessed a special tax for said street improvement against each of said lots or parcels of ground as shown by said plat and schedule and abutting or adjacent to the streets and parts of streets heretofore mentioned, said special tax to bear interest at the rate of six (6) per cent, per annum, payable as by statute provided from the 28th day of August, A. D. 1914.

The separate lots or parcels of ground so assessed for such improvement, and the names of the several owners, as far as practicable, and the amounts assessed against each lot or parcel of ground were then designated and set out in full in said resolution.

It was then by said resolution ordered that this assessment and levy be duly entered on the records of the City of Tama, Tama County, Iowa, and the City Clerk was ordered to duly certify at the end of thirty (30) days from the date of this assessment to the County Auditor of Tama County, Iowa, the said tax and assessment of each owner of property as there set forth, except such assessment, if any, as may have been paid in cash, and also as to each owner and parcel of property so assessed, to fix the number of installments and time when payable.

I further certify that there was so assessed against the lots or parcels of ground hereinafter set forth, situated in Tama, Tama County, Iowa, the amounts here shown, and that the owners thereof have paid the portion of their assessments specified, leaving the amount assessed and still unpaid as here shown, TO WIT:

OWNER'S NAME	LOT	BLOCK	SUBDIVISION	TOTAL ASSESSMENT	REMARKS
IOWA RY. & LIGHT CO	T' RIGHT	OF WAY	775' LONG	2030.85	FIRST INSTALLMENT \$290.12 BAL. DUE IN 6 INSTALL'TS \$1740.73
JOHN BONACEK	E 1/2-3	1	ORIGINAL TOWN 'IUKA' NOW TAMA	239.60	
LULA A. APPEL	W 1/2-4	1	"	238.76	
MARY A. AHLBRECHT	W 3/4-6	10	BODFISH & HARMON'S ADD.	371.18	
JOHN BONACEK	E 1/2-5	10	"	210.80	
JOHN BONACEK	W 1/4-4	10	"	101.48	
M. G. MURDOUGH	E 3/4-4	10	"	200.00	REDUCED TO \$150 PD. IN FULL
EARL SPOONER	20	11	"	125.00	REDUCED TO \$85 PD. IN FULL
JANE RICHARDS	19	11	"	175.00	REDUCED TO \$150 SIGNED WAIVER
JANE RICHARDS	18	11	"	125.00	REDUCED TO \$100 SIGNED WAIVER
R. SPIRE	W 23'-13	11	"	244.00	
R. SPIRE	E. 1'-12	11	"	10.00	
THOS. MURRAY EST.	12	6	ORIGINAL TOWN 'IUKA' NOW TAMA	490.52	
1ST NATIONAL BANK	W. 8.25"-2	6	"	12.48	
1ST NATIONAL BANK	1	6	"	419.04	
1ST NATIONAL BANK	14	5	"	431.52	
R. M. COFFIN	11	5	"	235.25	
R. M. COFFIN	10	5	"	235.25	
R. M. COFFIN	520'-19	5	"	7.85	
JULIA KALLAM	21	6	"	177.25	
MARY A. AHLBRECHT	20	6	"	177.25	
W. F. SPOONER	19	6	"	177.25	
W. H. AHLBRECHT	17	6	"	183.25	
W. H. AHLBRECHT	16	6	"	183.25	
W. H. AHLBRECHT	15	6	"	183.25	
W. H. AHLBRECHT	14	6	"	272.66	
W. H. AHLBRECHT	13	6	"	217.18	
ANNA MINOR (PUSHNEY)	N 1/2-6	12	BODFISH & HARMON'S ADD.	42.81	
ANNA MINOR (PUSHNEY)	537.5'-5	12	"	64.21	
CHAS. EIGHME	8 EX. 25'x17'	7	ORIGINAL TOWN 'IUKA' NOW TAMA	375.00	REDUCED TO \$300.00 PD. IN FULL

I hereby certify the foregoing is correct.

WITNESS MY HAND THIS 16TH DAY OF DECEMBER,
A. D. 1914.

SEAL

T. M. McCURDY

City Clerk of Tama,
Tama County, Iowa.

Between 109 & 110

The tax above certified is payable in six (6) annual installments, the first of which, with interest on the whole assessment unpaid at the rate of six (6) per cent, per annum, from the 28th day of August, A. D. 1914, is payable at the same time and in the same manner as the March semi-annual payment of ordinary taxes in 1914. The other installments are payable annually thereafter with six (6) per cent interest with the privilege of property owners to pay said tax in full at any time with interest to the time of such payment.

I further certify that there was assessed and levied as a tax for said street improvement against the lots or parcels of ground hereinafter set forth, situated in the City of Tama, Tama County, Iowa, the amounts here set forth and that the following named owners have not signed the waiver as provided by law, TO WIT:

The last thirty (30) assessments (second list) with interest at the rate of six (6) per cent, per annum, from the 28th day of August, A. D. 1914, are due and payable at the same time and in the same manner as the March semi-annual payment of ordinary taxes in 1915.

I hereby certify the foregoing is correct.

WITNESS MY HAND THIS 16TH DAY OF DECEMBER,
A. D. 1914.

SEAL

T. M. McCURDY
City Clerk of Tama,
Tama County, Iowa.

RESOLUTION ORDERING ISSUANCE OF BONDS FOR BALANCE
DUE ON ASSESSMENT AGAINST ABUTTING PROPERTY.

WHEREAS, The City Council of Tama, Tama County, Iowa, on the TENTH day of November, 1914, adopted a resolution whereby there was assessed and levied a special tax for street improvement heretofore constructed under a contract with Thos. Carey & Sons, on the following streets and parts of streets, TO WIT: Third Street, Fourth Street, Siegel Street, McClellan Street and State Street (Limits fully described in the Resolution of Necessity, see Page 57), all in Tama, Tama County, Iowa, against the property abutting thereon and adjacent thereto.

WHEREAS, there has been paid into the hands of the City Treasurer on such assessment the sum of \$10,380.09, leaving a balance due of \$24,500.00, therefore,

BE IT RESOLVED BY THE CITY COUNCIL OF TAMA,
TAMA COUNTY, IOWA:

That the Mayor and City Clerk be and they are hereby authorized to issue bonds against such assessment to the amount of \$24,500.00, said bonds to be signed by the Mayor, and countersigned by the Clerk and sealed with the Corporate seal, as by statute provided. Said bonds shall be issued to become due in the amounts at the option of the City of Tama, Tama County, Iowa.

No. 1	\$1,000.00	shall mature	April 1, 1915
No. 2	\$1,000.00	" "	April 1, 1915
No. 3	\$1,000.00	" "	April 1, 1915
No. 4	\$500.00	" "	April 1, 1915
No. 5	\$500.00	" "	April 1, 1915
No. 6	\$1,000.00	" "	April 1, 1916
No. 7	\$1,000.00	" "	April 1, 1916
No. 8	\$1,000.00	" "	April 1, 1916
No. 9	\$500.00	" "	April 1, 1916
No. 10	\$500.00	" "	April 1, 1916
No. 11	\$1,000.00	" "	April 1, 1917
No. 12	\$1,000.00	" "	April 1, 1917
No. 13	\$1,000.00	" "	April 1, 1917
No. 14	\$500.00	" "	April 1, 1917
No. 15	\$500.00	" "	April 1, 1917
No. 16	\$1,000.00	" "	April 1, 1918
No. 17	\$1,000.00	" "	April 1, 1918

No. 18	\$1,000.00	shall mature	April 1, 1918
No. 19	\$500.00	" "	April 1, 1918
No. 20	\$500.00	" "	April 1, 1918
No. 21	\$1,000.00	" "	April 1, 1919
No. 22	\$1,000.00	" "	April 1, 1919
No. 23	\$1,000.00	" "	April 1, 1919
No. 24	\$500.00	" "	April 1, 1919
No. 25	\$500.00	" "	April 1, 1919
No. 26	\$1,000.00	" "	April 1, 1920
No. 27	\$1,000.00	" "	April 1, 1920
No. 28	\$1,000.00	" "	April 1, 1920
No. 29	\$500.00	" "	April 1, 1920
No. 30	\$500.00	" "	April 1, 1920
No. 31	\$500.00	" "	April 1, 1920

Said bonds shall be issued in sums of not less than One Hundred Dollars (\$100.00) nor more than One Thousand Dollars (\$1,000.00), and shall bear interest at the rate of six (6) per cent, per annum, payable annually, principal and interest payable at the Commercial Savings Bank, of Tama, Tama County, Iowa.

When said bonds have been issued they shall be delivered to the City Clerk who shall register them, countersign them, and deliver them to the City Treasurer.

When said bonds have been executed and delivered as aforesaid, the Treasurer shall deliver them to the Commercial Savings Bank, of Tama, Tama County, Iowa, to whom said bonds were assigned by Thos. Carey & Sons, for that portion of said street improvement payable from this sum amounting to \$24,500.00, taking said Bank's receipt therefor, and the receipt filed. In no case shall the bonds be sold or negotiated for less than their par value with accrued interest from the time of delivery thereof.

Passed this 14th day of December, 1914.

C. J. WONSER

Mayor.

T. M. McCURDY

City Clerk.

OUTSIDE COVER OF BONDS

NO. (_____)

CITY IMPROVEMENT BONDS

CITY OF TAMA, IOWA

\$(amount)

Dated August 28th, A. D. 1914
Due April 1, ...(get the year date
from the resolution)

Payable annually at the Commercial
Savings Bank, Tama, Tama County, Iowa.

STATE OF IOWA }
COUNTY OF TAMA } SS:

This bond duly and properly
registered in my office this....
day of :....., 19.....

Treasurer of the City of Tama, Iowa.

UNITED STATES OF AMERICA

No. (.....)

\$ (Amount)

STATE OF IOWA

COUNTY OF TAMA

CITY OF TAMA

CITY IMPROVEMENT BOND

THE CITY OF TAMA, in the State of Iowa, for value received, promises to pay bearer \$....(\$1,000.00 or \$500.00, whichever it may be), lawful money of the United States of America, on the First day of April, 19... (whatever year it may be), with interest on the said sum from the date hereof, until paid, at the rate of SIX (6) PER CENTUM per annum, payable annually on the First day of April, in each year, on presentation and surrender of the interest coupons hereto attached; both principal and interest payable at the Commercial Savings Bank, of Tama, Tama County, Iowa.

This bond is issued by the City of Tama, pursuant to the provisions of Section 906, et. seq. Chapter 12, Title V, of the Code of Iowa, and in conformity to a resolution of the Council of said City duly passed, a true and complete copy of which resolution is printed on the back of this bond.

AND IT IS FURTHER CERTIFIED AND RECITED, That all acts, conditions and things required by the laws and constitution of the State of Iowa, to be done precedent to and in the issue of this bond have been properly done, happened and been performed, in regular and due form as required by law, and that the total indebtedness of said City, including this bond, does not exceed the constitutional or statutory limitations.

IN TESTIMONY WHEREOF, Said City, by its Council, has caused this bond to be signed by its Mayor and attested by its Clerk, with the seal of said City attached, this Twenty Eighth day of August, A. D. 1914.

ATTEST

C. J. WONSERMayor of the City
of Tama, Iowa.T. M. MCCURDYCity Clerk of the City
of Tama, Iowa.

COUPONS.

1-2-3-4-5- have ONE coupon each
 6-7-8-9-10- have TWO coupons each
 11-12-13-14-15- have THREE coupons each
 16-17-18-19-20- have FOUR coupons each
 21-22-23-24-25- have FIVE coupons each
 26-27-28-29-30-31- have SIX coupons each

No. (....) TO THE TREASURER OF THE
 CITY OF TAMA, IOWA

Will pay to bearer Dollars
 on the First day of April (Coupons No. 1 will be
 1915 -- No. 2 1916 -- No. 3 1917-- etc.) at the
 Commercial Savings Bank of Tama, Tama County, Iowa,
 for annual interest on its City Improvement Bond,
 dated August 28th, A. D. 1914.

 Mayor.

ATTEST:

 City Clerk.

ON THE BACK OF THE BOND PLACE THE RESOLUTION
 (For Resolution, see Page 111.)

COUPONS NO. I AMENDED

THE CITY TREASURER OF THE CITY
OF TAMA, IOWA,

Will pay to bearer - - - - - Dollars
on the First day of April, 1915, at the Commercial
Savings Bank, of Tama, Tama County, Iowa, for in-
terest from August 28th, A. D. 1914, on its City
Improvement Bond, dated August 28th, A. D. 1914.

C. J. WONSER

Mayor

ATTEST:

T. M. McCURDY

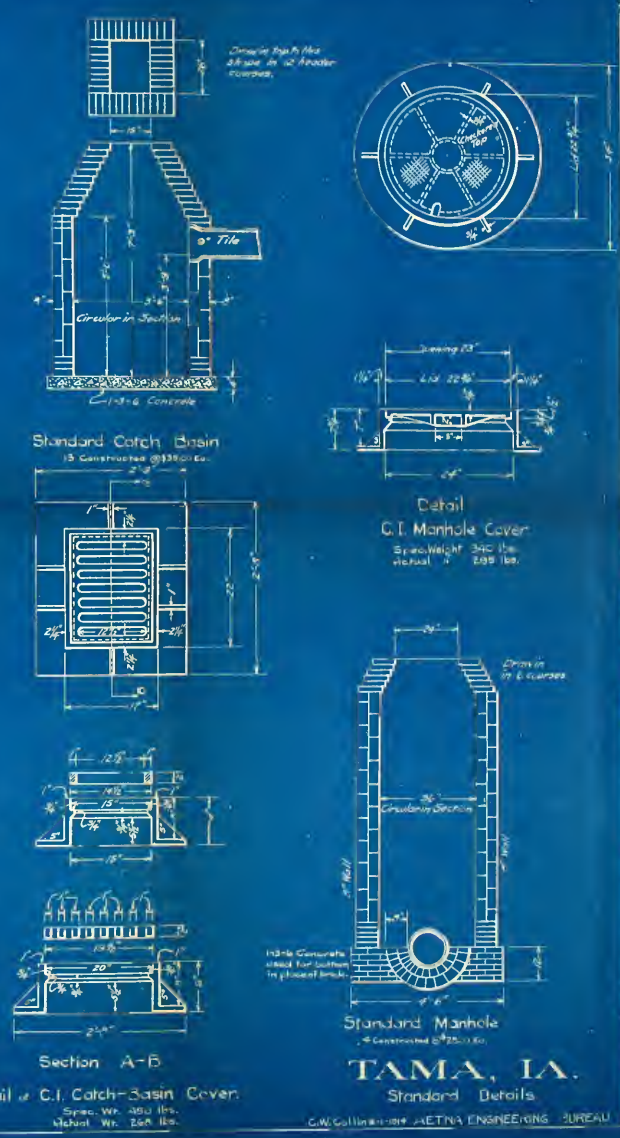
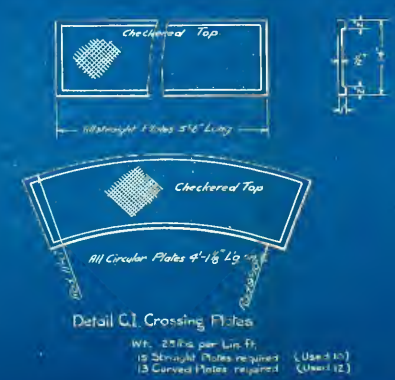
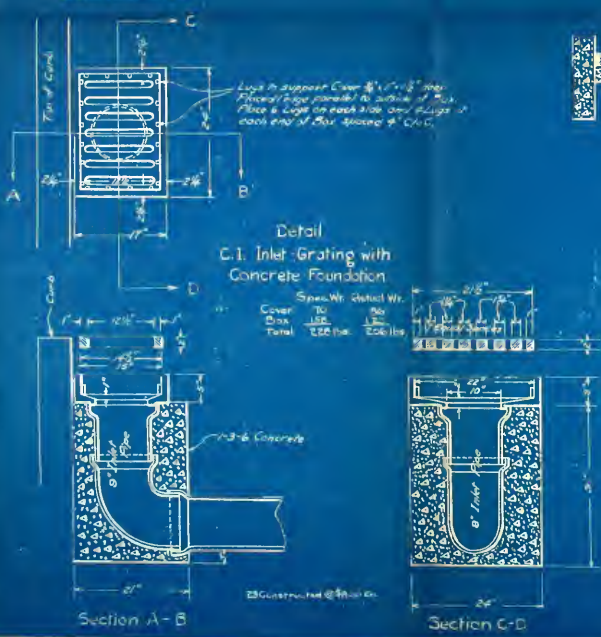
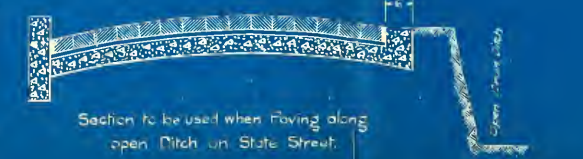
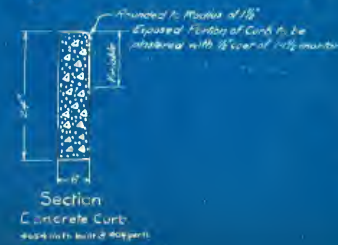
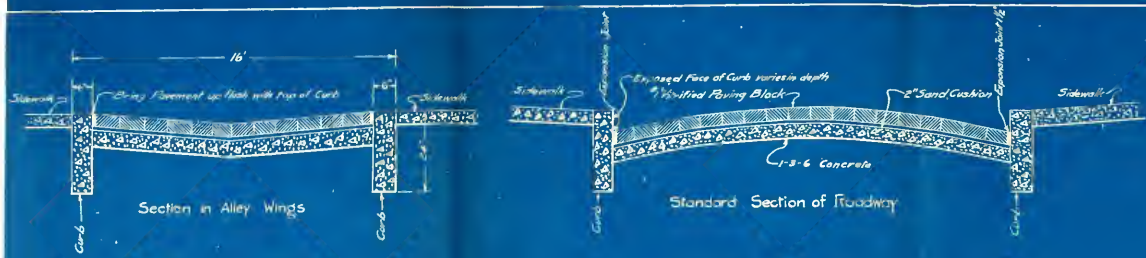
City Clerk.

GENERAL PLAN

29

DETAILS

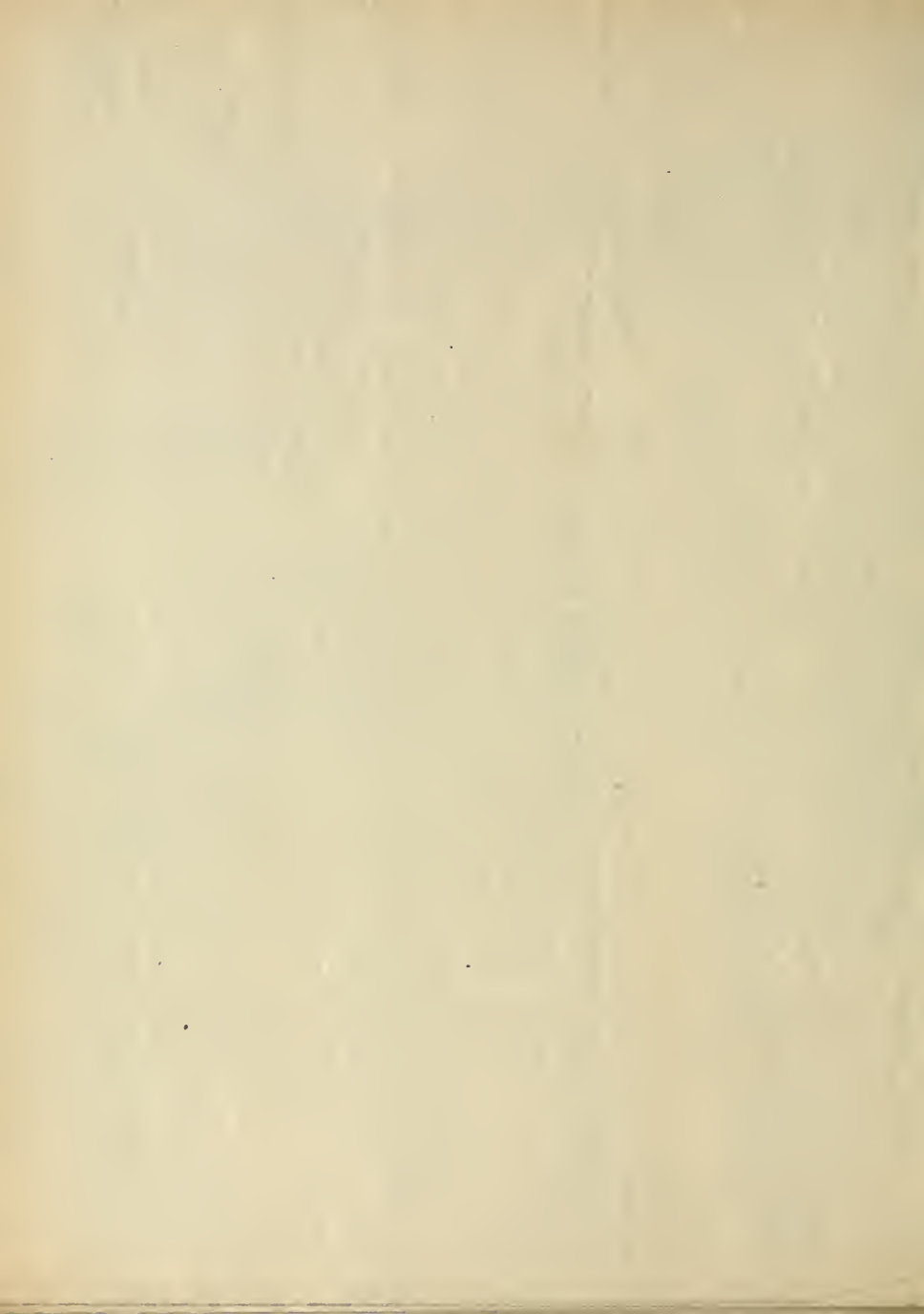
✓
Details



TAMA, I.A.
 Standard Details
 C.W. Collins and J. METNA ENGINEERING BUREAU

ASSESSMENT PLAT





T	25754	
q625.8		C69
Collins, C. W.		
Paving business section of		
Tama, Ia., with vitrified		
		brick

T	25754	C69
q625.8		

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